Teaching Orthodontic Emergencies Using The "Flipped Classroom" Method Of Teaching – A Mixed Methods Randomised Controlled Trial

Thesis submitted in accordance with the requirements of the

University of Liverpool for the degree of

Doctorate of Dental Science

By

Grant Isherwood

Word Count – 41,712

13 / 06 / 19

Acknowledgements

I would like to express my deep gratitude to my supervisors Dr Flannigan and Dr Taylor for their guidance, constructive advice and encouragement during this research project. Without their efforts, completion of this project would not have been possible. Their patience and willingness to give up so much of their time has been very much appreciated.

I am sincerely grateful to Girvan Burnside for his time and support with statistical analysis of the data. His expertise and statistical knowledge have been invaluable, and I would like to thank him for enabling multiple visits to his office to ask about statistical queries, often unannounced.

I would also like to extend my gratitude to the students at Liverpool University Dental Hospital. Likewise, this project would not have been possible without their efforts and willingness to participate. The richness of the qualitative data collected superseded my expectations in so many ways.

Table of Contents

Abstract

Introduction: The General Dental Council requires newly graduated dentists are competent when managing orthodontic emergencies. Undergraduate students typically receive limited exposure to clinical orthodontics, with the ideal management of these scenarios largely delivered through conventional lectures. The flipped classroom method of teaching involves knowledge being acquired in students' own time, with class time instead focussing on construction of meaning.

Methods: 61 undergraduate dental students were randomised into either a flipped or conventional group. The conventional group (n=30) attended a lecture describing the management of six common emergencies. The flipped group (n=31) were given access to six videos via a virtual learning environment and later completed practical tasks related to the material. Both groups completed a SBA assessment. Perceptions of flipped classroom teaching were explored via focus groups.

Results: For questions on orthodontic emergencies, the conventional group had a mean exam result of 70.5% (S.D. 8.0%) compared with the flipped group result of 72.8% (S.D. 12.9%). There was no significant difference between the groups (p=0.532). For regular orthodontic questions the conventional group had a mean exam result of 64.8% (S.D. 19.9%) compared with 78.3% (S.D. 21.7%). There was no significant difference between the groups (p=0.083). Thematic analysis identified the following themes: ways in which videos encourages more effective learning, improved engagement, awareness of learning needs and proposed teaching / curriculum changes. The overarching theme was facilitating an experiential learning cycle using flipped classroom teaching.

Conclusions: The flipped classroom method of teaching resulted in comparable exam performance and improved levels of satisfaction.

(250 words)

Chapter 1: Introduction

1.1: Orthodontic Emergencies

Patients who undergo orthodontic treatment can sometimes encounter acute discomfort once they leave the clinical environment. This may be considered an, 'orthodontic emergency'. An orthodontic emergency can be defined as an unscheduled appointment for treatment of a problem relating to an orthodontic appliance. (1) These problems can vary in their severity, from mild discomfort to a fractured component causing more serious discomfort. Patients with more serious discomfort are likely to need treatment sooner rather than later. Patients may choose to seek help from the same orthodontic practitioner, their general dental practitioner (GDP), or be referred to the Emergency Dental Service, particularly if they seek help via the urgent and emergency care service telephone line (111). Fortunately, many issues can be easily treated by the GDP using simple measures and then followed up by the orthodontist. There are very few situations where an immediate referral to an orthodontist or medical practitioner is required. In some true emergency cases, such as airway obstruction and inhalation of a foreign body, referral to an Accident and Emergency department is more appropriate. If an orthodontic emergency presented to a general dental practitioner, the General Dental Council (GDC) expect registered dentists to be able to undertake limited procedures involving orthodontic appliances in an emergency situation. (2) Likewise, competences for the European Dentist outlined by the Association for Dental Education in Europe (ADEE) state that dental graduates should be able to manage all forms of orthodontic emergency, including the referral process when necessary. (3) Dental students should therefore be exposed to orthodontic emergencies at

undergraduate level in order to develop knowledge, competence and confidence in managing orthodontic emergencies.

The Royal College of Surgeons of England has produced audit methodology enabling orthodontists to audit the cause and incidence of unscheduled appointments. (4) This was in an attempt to reduce their occurrence, ensuring more effective use of clinical time. An acceptable standard for unscheduled visits was deemed 'less than 5% of visits'. (4) Other audits have made an attempt to more closely analyse the reasons for unscheduled visits. (5) The results showed that problems relating to fixed appliances accounted for approximately 8 times more visits than any other treatment modality (removable appliance, retainers etc.) and more than 50% of these appointments were unscheduled visits. Therefore, the Royal College of Surgeons of England deemed this number unacceptable.

There is currently limited published literature relating to the confidence of undergraduate students in treating orthodontic emergencies. Of the studies that have been published (6–8) additional information relating to the types of emergency encountered, the setting and the reasons for the change in reported confidence levels have not been identified. However, what has been published suggests that student confidence in dealing with orthodontic emergencies is low. In a publication measuring mean self-reported confidence levels amongst final-year dental students from Cardiff University and The University College Cork, were low when compared with other dental procedures. Students ranked treating orthodontic emergencies as 37th of the 41 dental procedures listed in the study. (1) Only confidence levels in carrying out copy dentures, stainless steel crowns, vital tooth bleaching and surgical extractions scored lower.

After graduation, confidence treating orthodontic emergencies continues to be low. A survey of Vocational Trainee's (VTs) in their first year of employment found that 60% were not confident in managing an orthodontic patient. (6) In addition, 72% of VTs stated they were not confident with the use fixed orthodontic appliances and 55% with the use of removable appliances. (7) Furthermore, 50% of Vocational Trainers considered new graduates to be prepared either 'very well' or 'well' for an orthodontic patient in general practice. The trainer's perception of undergraduate orthodontic training with regard to fixed and removable appliances was by definition inadequate.

A separate survey of dentists with more clinical experience (i.e. who had graduated within the previous 10 years) reported slightly more positive findings, with 60% of respondents stating they were confident in treating orthodontic emergencies. (8)

It is important for dentists to possess a level of confidence that will allow them to successfully manage orthodontic patients attending with emergencies in a practice setting. Understanding the reasons why self-reported confidence of students and new graduates is low would provide valuable information to feed back into teaching programmes in order for these problems to be addressed.

Thus, improvements in undergraduate dental education relating to orthodontic emergencies must be made.

In order teach more effectively, first of all it is worth considering how individuals learn.

1.2: Learning Theories And Principals

"Confusion is no bad thing; it is the first step towards understanding" – Edmund Teller (9)

Education itself is thought to have developed from the human struggle for survival and enlightenment. The first formal documented provision of education is unclear and has subsequently been contested among academics. However, it is thought to originate in Egypt somewhere between 3000-500BC. Although priests were responsible for teaching religion to their students first and foremost they also incorporated basic principles of writing, mathematics, the sciences. Education, at least from a historical standpoint, was a luxury and could only be afforded by the most privileged in society. By the end of the 19th century, various countries had formed compulsory education systems for children and by the 1960's, China and Latin America made the education of 6-9 year olds compulsory. (10)

Learning itself may be defined as 'a persisting change in performance or performance potential that results from experience and interaction with the world'. (11) Each individual interacts with their environment in a unique way based on characteristics such as intelligence, personality, beliefs, experiences and culture. In light of this, there is no single definition for how individuals learn most effectively. In addition, educators should be aware of how their own beliefs about learning may influence the way that they teach. The aim of medical education specifically, is to equip clinicians with the skills to maintain and develop their expertise over the course of a lifetime. In order to achieve this, numerous attempts have been made to

categorise how individuals learn. Current literature suggests there are eight accepted general theories of learning:

- Adult learning principle (12)
- Social cognitive theory (13)
- Reflective practice (14)
- Transformative learning (15)
- Self-directed learning (16)
- Experiential learning (17)
- Situated learning (18)
- Learning in communities of practice (19)

These educational theories are essential from the standpoint of the educationalist, in that, it gives choice and understanding as to why things are done in a particular way. There has been a shift away from expecting students simply having lots of knowledge, to consideration about higher order thinking, professionalism, and reflection. Sound educational principles are needed in order to foster these types of behaviours / learning outcomes.

1.2.1: The Adult Learning Principal

The principals of adult education have been studied extensively. (20–24) Generally speaking these are similar to what was proposed by Darkenwald and Merriam: (23)

- Cultivation of the intellect
- Individual self-actualisation
- Personal and social improvement
- Social transformation

• Organisational effectiveness

Several theoretical frameworks have been developed around these principals. Merriam categorised these into three distinct entities: (24)

- The first is adult learning characteristics, in which the best-known framework is 'andragogy'. Also in this group is Cross's "Characteristics of Adults as Learners" model, based on differences between adults and children across personal and situational characteristics. (25)
- The second category emphasises the adult's life situation. Two theories have been proposed: Knox's "Proficiency Theory" (26) and McClusky's "Theory of Margin". (27)
- The third category centres on changes in consciousness. Several models in this category emphasise reflection upon experience and environment of which Mezirow's "Perspective Transformation" (28) and Freire's "Theory of Conscientisation" (10) are the best developed models.

Merriam, Caffarella, and Baugartner (29) summarised various adult learning theories and concluded that no single theory is able to adequately describe adult learning due to the complex and multifaceted nature of the process.

1.2.2: Social Cognitive Theory

Social cognitive theory acknowledges that learning is social in nature i.e. we learn from the interaction with others and our environment. Social cognitive theory was originally developed by Bandura (13) and combines two approaches to our understanding of learning. The behaviourist approach emphasises the influence of the environment in our learning and functioning. The cognitive approach emphasises the importance of thought in our learning and functioning. The two

approaches are combined and simply refer to the theory that our actions, learning and functioning are the result of a continuous, dynamic, reciprocal interaction among three sets of factors: personal, environmental and behavioural.

- Personal factors include the individual's attitudes, perceptions, values, goals, knowledge and all previous experience.
- Environmental factors combine all those influences that influence actions and the achievement of goals. Individuals are able to create, alter and destroy their environment, which results in changing them at a personal level (13)
- Behavioural factors simply influence the process of learning.

Bandura views humans as possessing five basic capabilities that underpin our learning and functioning in all situations. These capabilities are particularly important when we consider the processes of learning in medical and health professional education.

- Symbolising capability – Almost every part of our lives is influenced by our ability to use symbols to change our experiences into something that can be internalised and serve as a guide to future actions. This ability allows us to calculate possible solutions symbolically, rather than taking time to try out each alternative.
- Forethought capability – Most of our behaviour is regulated by thought. We anticipate the probable outcomes of our actions and the plan goals for ourselves to achieve our desired outcomes. Our actions maximise the chances of obtaining them. Also, as noted, images of desirable future events, such as achieving our goals, can become motivators of our current behaviour.
- Vicarious capability – If learning occurred only from performing actions and experiencing effects, learning would be a slow, tedious process. Fortunately,

learning can be also be acquired via the observation of the actions of other people and the consequences they experience. This applies to social development, where new behaviours can only be learnt using modelling. Even if learning can occur in other ways, the ability to learn vicariously shortens the learning process.

- Self-regulatory capability – In the social cognitive theory, self-regulation is crucial. The majority of our behaviour is regulated by our own standards and our reactions to our actions. Any inconsistencies between our actions and those standards are thought to activate a process of evaluation, which will influence our behaviour thereafter.
- Self-reflective capability – This involves our ability to reflect on our experiences critically and consider the thought processes used in that process afterwards. Cognitive theorists refer to this as metacognitive capability. Through self-reflection we gain understanding about our behaviour, our environment and ourselves.

A central concept in social cognitive theory is self-efficacy, where an individual passes judgement on their ability to perform a specific task or activity. These judgements change future actions as well as the goals we set ourselves, and our commitment to these goals. These judgements also affect: the degree of perceived difficulty of future goals; the effort required to achieve them, the length of time we must invest in pursuit of these goals in the face of obstacles, our resilience to adversity, the life choices we make, and what we can achieve. Bandura (13) noted that self-efficacy beliefs affect not just our behaviour, but our goals and aspirations: they also determine what barriers and opportunities we see in the environment.

1.2.3: Reflective Practice

The term ‘reflective practice’ can be attributed to Dewey (30) and was later expanded on in the 1980’s by Schon. (14) It can be described as ‘the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective’. (31) Practical experience is at the centre of professional learning and it has been suggested that educational programs should include reflective processes based on personal experiences. (32) This is because as knowledge is embedded in practice, practitioners are positioned to test and revise theories through practice. They do so by reflection and then action. The reflective process, as such, serves as a bridge in the theory-practice relationship. Various authors have proposed alternative definitions. Clift et al. examined issues and programs that encourage reflective practice in education but it is the aforementioned work of Schon (14) who has been the most influential in our understanding of reflective practice, summarising the need for a new scholarship recognising in action, on-the-spot experimentation and action research.

These studies are based on a range of disciplines and argue that formal theoretical knowledge is often useless when solving I’m attempting to solve complex problems in real life. His suggestions centre on the need for professional scholarship and recognition of an epistemology of professional practice. Reflective learners should incorporate these principles by relating their own personal knowledge relating to practical competence and then professional activity. The link between theory and practice can inform each other.

On-the-spot reflection involves three things and is an iterative process where instates and learning from one experience maybe incorporated into future learning:

- Reframing/ reworking the problem from different perspectives

- Establishing where the problem fits into learned behaviours
- Understanding the elements and implications present in the problem, its solution and consequences

The process of transforming experiences into knowledge, skill, attitudes and values have in the past been explained diagrammatically by means of experiential /learning cycles, for example, that of Kolb. (33) (See figure 1)

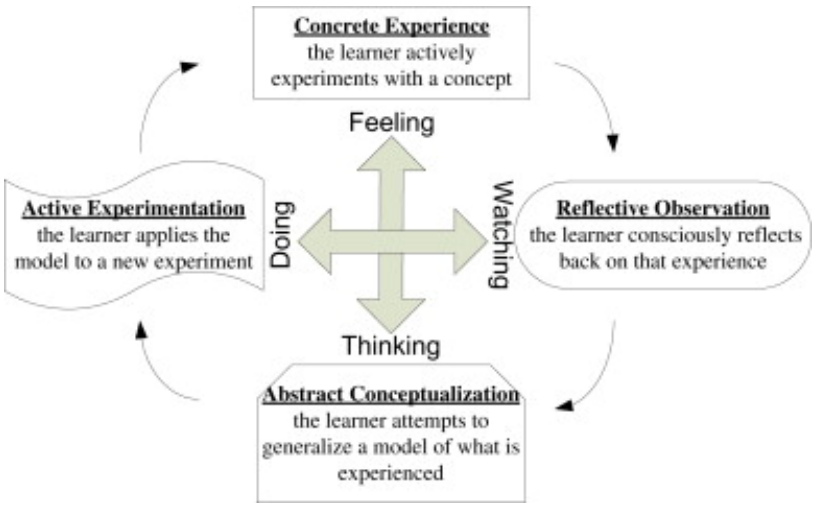


Figure 1 – Kolb's experiential learning cycle (33)

The cycle described by Kolb firstly describes concrete experience, observations and reflections, formulation of abstract concepts/generalisations, and the testing of implications of concepts in new situations in a cyclical model. Jarvis thought that this cycle or model was too simplistic and developed another model representing something altogether more complex. (22) In this model nine possible responses to an experience are possible, which can be divided into three distinct categories including non-learning and non-reflective learning as well as reflective learning. Non-learning includes concepts like presumption that previously learnt experience trusted and well accepted by someone. Non-consideration, where people are too

busy or uncomfortable to explore something further and rejection where the possibility of learning from an experience is rejected there is something like bias preconceived ideas such as bigotry. Non-reflective learning includes incidental learning, the learning of repetitive skills and muscle memory. (See figure 2)

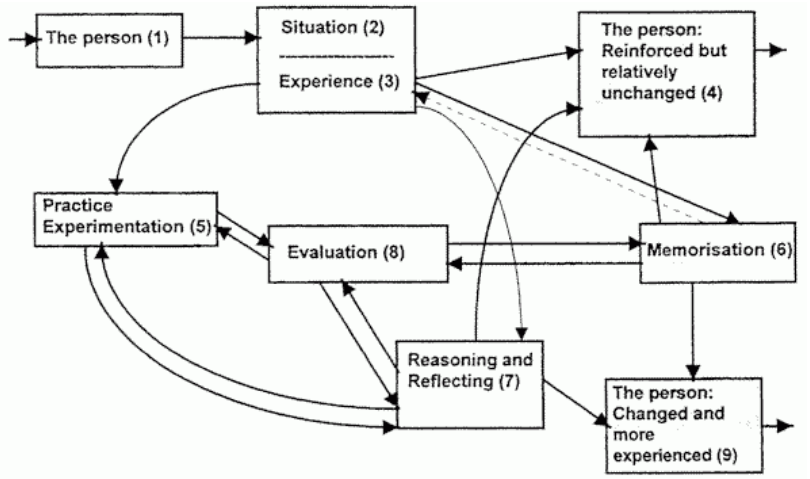


Figure 2 – The reflective learning cycle described by Jervis (22)

Other offers have suggested that there are three considerations that are related to reflection. These are cognition, critical thinking and narrative enquiry.(34) Schon referred to these processes as problem setting and thought the professional learning seems to be come from continual action and then reflection on problems. (14) This knowledge or perceived knowledge game is difficult to identify and analyse. As knowledge is constructive, professional reflect on an experience and develop their personal theoretical system. In 1990, Ross identified a series of steps in reflective thinking (35) :

- Recognising the nature of the problem
- Responding by recognising similarities and differences to other consequences and implications of a possible solution or solutions

- Examining the intended and unintended consequences of the solution that is sought

Swanwick created another simplistic model for reflective practice, which is similar to these other approaches. (36) The series of steps in his model are:

- What was the nature of the problem?
- What were the consequences?
- How was it addressed?
- What was learned about the problem and the learner as an individual?
- How will the same or similar situation be addressed next time?

Something that is not often considered is learning via secondary experiences or the experiences of others. Within professions these interactions can represent a powerful way of learning not just about facts, but also about reasoning. While there is the potential to learn in any situation, the greatest source of learning is from our peers and patients. There is an increasing body of research that has explored the situated character of human understanding and communication and examined the relationship between learning and the social situation this learning occurs. This research regards learning as a form of social participation rather than simply knowledge acquisition. The environment, in which learning takes place, is very important. One aspect of situated learning is that learning takes place within the framework of participation, which is mediated by differences in the perspectives of each participant. It is the community that learns rather than each individual. (18)

1.2.4: Transformative Learning

Transformative learning is a complex theory that has over the past two decades developed comprehensively. First described by Mezirow, (15) transformative learning theory can be defined as, 'the social process of constructing and internalising a new or revised interpretation of the meaning of one's experience as a guide to action.' (15) It helps adults to elaborate, create and transform their beliefs, feelings, interpretations and decisions through reflection on the content; the process by which they were learned. It contrasts with conventional learning, which simply elaborates the learners existing ways of thinking, feeling or doing, relative to the topic. Although the learning process is improved, the learners' fundamental structure is maintained throughout. Critical reflection and rational discourses are the primary processes used in learning. The core of transformative learning is the discovery of mistakes in learning. Empowering learners is both the aim and a necessity for transformative learning. Empowered learners appreciate that they're able to fully participate in critical discourse and then use this to inform future decisions regarding their learning. The ability to assess evidence and engaging critical reflection is an obvious requirement. (37) Reflection is a key concept in Mezirow's theory, which defined reflection as, 'process process of critically assessing the content, process premises of our efforts to interpret and give meaning to an experience.' (38) You subdivided reflection into three main types:

- Content reflection – an examination of the content or a description of a problem
- Process reflection – examination of the problem-solving strategies being used
- Premise reflection – questioning the problem in itself which may lead to a transformation of belief systems

Mezirow explained that discourse is vital in this form of learning and referred to a tape of dialogue where the focus is on content and trying to justify police by giving

reasons and by examining the evidence for competing viewpoints. It is a complicated and emotional process, where substantial knowledge and skill on behalf of the learner is required in order to be utilised to good effect. A new paradigm is created but only after the old paradigm becomes dysfunctional or does not fit with current thinking. It is the responsibility of the transformative educator to challenge the learners' current perspective. The shift in paradigm will only occur if the learner perceives the existing paradigm to be inadequate in explaining their experience. One problem that may arise as a result of this form of learning is that the learner is hesitant or resistance discarding the old paradigm and resists the transition to the new paradigm. The Intensity of the relationship between the teacher and the learner may intensify due to the teacher intentionally aiming to render the existing beliefs of the student inadequate. Successful transformative learning asks questions of learners' assumptions, provides support from others in a safe environment, provides challenges for the learner, examines different perspectives and lastly provides adequate feedback. Any new assumptions are then tested in discussion with others.

In practice, educators must provoke, challenge and stimulate critical thinking. Cranton suggested the following guidelines for indicators: (39)

- Promote rational discourse - this is a fundamental component of transformative learning must exist at the beginning of empowering learners
- Promote equal participation in discourse - this can be done by stimulating discussion the provocative incident or controversial statement
- Develop discourse procedures – avoid introducing any personal beliefs therefore making dismissive statements
- Develop group facilitation skills – for example dominant/silent participation
- Encourage decision-making by learners
- Encourage critical self reflection = this can be done by challenging learners, asking questions and suggesting differences between alternative standpoints

- Consider the individual differences between learners – learner should be it made aware of their own learning styles and preferences and that the educator needs to promote unawareness of the differences between learning styles and individuals
- Use several different and perhaps innovative teaching / learning styles. This may include role-play, exposure to new knowledge, journal writing etc.

1.2.5: Self Directed Learning

Zimmerman claimed that learners can be described as self-regulating to the point where they are “meta-cognitively, motivationally, and behaviourally active participants in their own learning process”. (40) Much of the research relating to self-regulated learning has been performed in secondary schools, with some studies at higher-level education. This as a cycle of four phases: planning, learning, assessment and adjustment, with each phase consisting of different subgroups. (See figure 3)

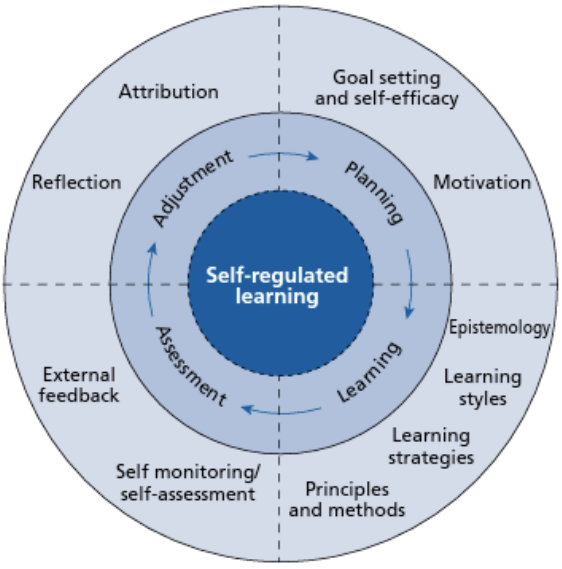


Figure 3 - The self-regulation learning cycle (40)

1. Goal Setting - In order to self-regulate effectively, learners must set specific goals. This is the creation of standards of performance linked to achieving specific outcomes. The motivational benefits of goals are dependent not just on goal setting, but also on learner commitment to achieving them. (41) Personal and environmental factors influence goal choice and commitment. Personal factors include skill level, previous performance and beliefs about goal value. Social-environmental factors include group norms, group and peer goals, and role modelling by peers.
2. Motivation – This involves individuals initiating and maintaining activities directly aimed at achieving their goals. In the cycle of self regulated learning, achieving goals influences self-efficacy, which, reinforces motivation. Intrinsic motivation involves doing something because it is naturally interesting and enjoyable. Extrinsic motivation involves doing something to obtain an outcome separate from the activity. Although all learners bring some level of motivation to their learning (42), educators can create environments that support development of intrinsic motivation. These environments provide: optimal challenges, involvement in learning, acknowledgement of feelings, opportunity to make choices about learning, and also for learners to evaluate their learning. (43) Although intrinsic motivation results in high-quality learning, educators cannot depend on all learners to be intrinsically motivated across all learning tasks. Self-determination theory emphasises that learners who are intrinsically motivated embrace learning, regardless of rewards or outcomes. (44)
3. Epistemology – Epistemology is the study of knowledge and justified belief. Although this is a complex aspect of learning, it is generally accepted that the pattern that an individual learns becomes more complex as they advance through a curriculum. (45)

4. Learning styles – These are the characteristics that learners possess that influence their learning. Researchers are continually making attempts to categorise individual styles, for example Kolb's cycle of experiential learning. (46) There is evidence that different learners have different preferences for learning, depending on time available for study, personal circumstances and context. If learners have prior knowledge about how they learn most effectively, this can help them choose their approach to learning.
5. Learning strategies – These are important because they are the only factor that learners can control. Choosing a learning strategy requires the learner to consider: their individual learning needs (what to study), learning styles (visual / auditory for example), learning contexts (the material being learnt) and other things such as environment and time of day. (47) The effectiveness of the chosen learning strategy will evolve as learners' progress through a curriculum. Strategies for learning basic information or skills will not be as effective for more advanced concepts and learners should be aware of this. Finally, learners can encounter problems when choosing the most appropriate strategies. They might not be very good at their chosen strategy, they might not match an appropriate strategy with the chosen learning environment, for example listening to a podcast of a lecture in a noisy room, or, they might lack motivation. (48)
6. Principles and Methods – Combining these allow teachers and learners to appreciate their respective roles. It is important for educators to communicate the specific principles underlying their expectations and approaches to learning if they are to help learners become self-regulating. It is equally important that learners understand these principles, so that they are prepared to meet the expectations. For example, as self-directed learners 'in training' they will be expected to set their own goals, use experts and resources to help them achieve their goals, be willing to take responsibility for their own learning, be able to

manage their own time and projects and assess themselves and their peers. (49)

7. Feedback – Feedback is a key component of self regulated learning. (50) Ideally, self-regulated learners develop their own systems to monitor their progress. Progress is related to achieving goals, however, learners might not be aware of deficits in their learning. Thus, it is crucial that learners receive timely feedback to improve and develop self-monitoring skills. When feedback is given in the self-regulated learning cycle, engaging in activities improves academic performance. (51,52) The goal of many instructional systems is to facilitate the transition from feedback to self-monitoring. (53) Most learners do not possess the ability to self-monitor progress effectively. (54) Instead they will often monitor their progress incorrectly sometimes preventing them from achieving their goals. This may be linked with their choice of learning strategy. If the strategy chosen is not linked effectively with what the learner needs to accomplish in the task at hand, the same faulty thinking that led to that choice might contribute to incorrectly judging progress towards goals.
8. Reflection – Reflection is an essential part of self-regulated learning. (55) In the context of self-regulated learning, reflection encourages individuals to consider themselves as learners with personal goals, beliefs and styles, to evaluate the processes or strategies they have chosen, and then to weigh the level of success these have contributed towards achievement of goals. Educators can employ different methods to help learners become comfortable with reflection, such as portfolios or writing in journals. Structured question frameworks are often used to elicit student reflection.
9. Attribution – This is where learners acknowledge whether their performance was the result of reduced ability or lack of effort. Reduced ability can hamper efforts to improve, while poor performance attributed to learning strategies can encourage efforts to experiment with different strategies in order to improve. (47)

Attribution theory provides a useful contemporary framework for thinking about specific factors to which learners attribute their academic successes or failures. (56) Learners who engage in strategic learning will often attribute success on the presence of sufficient strategic approaches. They will adjust their approaches to assure better outcomes and are therefore in control of the outcomes. (57) Successfully employed self-regulated learners may then possess the motivation to progress into the next cycle of learning.

1.2.6: Experiential Learning

The experiential learning theory, such as that described by Kolb (17) is derived initially from the work of Kurt Lewin (58), John Dewey (59) and Jean Piaget. (60)

Lewin (58) focused on group dynamics in social psychology concluding that the learning is best achieved in an environment that considers both concrete experience and conceptual models. Dewey (59)made guidelines for experiential learning in higher education, noting that the integration of experience and education was compulsory. Piaget (60) constructed the theory of how experiences are used to shape intelligence, when looking at the cognitive development process. Kolb's experiential learning theory is a model of learning based on research in social, educational and cognitive psychology and education.

Kolb's theory can be used as a framework in interpreting and diagnosing individual learners as well as designing learning environments. (61) The four learning environments are:

1. Affectively orientated (feeling)
2. Symbolically orientated (thinking)
3. Perceptually orientated (watching)

4. Behaviourally orientated (doing)

In each of these environments transforming experiences are the two main aims of the learning tasks. (62) In order to grasp their phenomena learners must appreciate concrete experience, which comes from a variety of different senses as well as abstract conceptualisation, which is both indirect and symbolic. Two processes occur in harmony here, that of reflection and the other of action. One, are indeed a combination of the four Learning environments can be utilised in learning, which is indeed enhanced if students are encouraged to use all four components of the framework.

In practice, there are three major guidelines for the implementation of an experiential Learning technique.

1. First of all, the learners' existing level of understanding are linked with new knowledge, abilities, beliefs and values.
2. Secondly, the learner is more assertive in their responsibility for their own learning. This leads to a shift from the traditional teacher/Learner relationship.
3. Finally, it involves the transfer of learning from an academic standpoint, to one that involves a more practical standpoint.

Looking at the *affectively* orientated environment, learners experience activities as if they were professional practitioners themselves; the learners' present values and experience generate information. Teachers act more as a role model for the learner rather than an authoritative figure. They convey information in a timely fashion, tailoring it to their requirements of each individual learner. They monitor the progress achieved via discussion and then critique carefully so that students are not prevented it from developing in any way. The learner must be able to work with

others and be able to encompass other values and feelings and become engaged in our learning group in a concrete experience.

The *symbolically* orientated environment means that the learner must use their experiences to develop skills or concepts in order to find the right answer to a problem. The source of information is conceptual, with the teacher being generally accepted as the body of all knowledge, the timekeeper and enforcer of events. Successful learning is measured using objective criteria, comparing learners' knowledge with correct answers. The teacher provides guidelines in relation to rules and terminology. Learners must be able to interpret quantitative data in order to test their theories. Using unique ideas and action plans learners develop their experiences and models. They relate to the experience of abstract conceptualisation.

In the *perceptually* orientated environment, the learner appreciates concepts and relationships from different perspectives. Teachers behave more as facilitators, emphasising processes rather than solutions two problems. They direct and explore connections between discussions, with learners evaluating answers individually. Performance is not measured against vintage criteria but instead by how effectively learners can implement pre-agreed criteria. Learners must analyse and manage data with an open mind, appreciating different ideas, being able to create plans of action and have an appreciation of ambiguous circumstances. When having an open mind when learning the learner undergoes a transformative experience of reflective observation.

Behaviourally orientated activities are related to specific problems where learners apply the competencies that they have gained. Teachers act as mentors reflecting on their background when getting any advice to learners. Learners themselves are

solely responsible for managing their own time and their own individual productivity. It is imperative for the learner to complete tasks using pre-agreed standards. Learners must make their own choices in order to maximise potential opportunities, and commit themselves to meeting predetermined goals they are encouraged to adapt to feelings of uncertainty as well as gate others. This relates to the transforming experience of active experimentation.

1.2.7: Situated Learning

Situated learning is related to the theories of learning that have both a social and cultural basis, which sees learning and development occurring via transformation through participation in community activities. Learners develop understanding through roles and responsibilities as they actively participate. (18) Situated learning is quite similar to experiential learning but differs in that it extends the concept to include experiential learning that occurs beyond the individual learner, as the learner contributes to and participates within the shared experience of a community. Situated learning is different from the other theoretical models discussed, in that, with conventional teaching, learning is a one-sided process where the main benefactor of the teaching is the learner. Situated learning is more about participation; where learning is achieved via collaboration with other learners and perhaps more senior members within a group performing activities. New participants will often perform less vital tasks initially and then the later gain more responsibility and thus perform more important tasks. As participation increases, learners come to understand the particular knowledge that separates their community from others. The central concept of situated learning is that learning takes place via social interaction, acquiring knowledge from others. Learning occurs in a dynamic interaction between the learner and the environment. Situated learning suggests

that learning is not separate from social influences in that the context in which teaching occurs is critical with different cultures and contexts having a part to play in the overall outcome. Knowledge relating to the task is only present in the specific context, or the location of that task. Situated learning as described by Lave and Wenger (18) goes even further, where they explain that all of the learning within a specific learning environment becomes learnt, both positive and negative.

The situated learning theory ideally describes the kind of learning that takes place via apprenticeship. From a medical education standpoint, the apprenticeship is between the master (the teacher) and the novice (the learner). The idea of cognitive apprenticeship, described by Brown, (63) relates to students being able to acquire develop and use cognitive tools in any location once mastered. The support provided by the teacher is gradually withdrawn over time as the learner develops more knowledge and experience in relation to a skill. In the situated learning model the apprenticeship is actually given to the whole community and the majority of the learning occurs in the relationships between the people participating rather than from the teacher to the learner. As one can imagine, situated learning also relates closely to informal learning. This is in stark contrast to formal learning environments created in medical education. Informal learning is a significant dimension of the learning that takes place every day and is unstructured, sometimes unintended and opportunistic by nature.

Finally, situated learning is very much related to the theoretical concept of constructivism, which views learning as a process of active participation in problem-solving and critical thinking. It is through these processes that learners can create their own knowledge and understanding based on prior experiences and knowledge gain.

From a practical standpoint, teaching students in a situated learning context is very difficult perform formally. It has been suggested that there are three levels of curriculum: formal, informal and hidden. (64) The formal curriculum represents that which is stated, the informal curriculum includes both explicit and unanticipated aims. The hidden curriculum may be observed in the practices and routines of a community rather than those of the individual themselves. The hidden curriculum teaches values and moral judgements and can be found in many institutions worldwide in their policies, actions, decisions, discussions and relationships. Situated learning may be a better method of delivering both the informal and hidden levels of a curriculum.

1.2.8: Learning In Communities Of Practice

Lave and Wenger (18) suggested the term community of practice be used to convey the importance of activity and integration of individuals within a community. It described the way that learners move from a peripheral position within the community to a more central position, moving from partial participation to full participation within the group. Barab, defines a community of practice as, “are persistent, sustaining social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and or mutual enterprise”. (65)

Wenger (19) suggested three categories within a community of practice: mutual engagement, joint enterprise and shared repertoire. Mutual engagement is achieved via interaction, shared tasks and opportunities for peripheral and often superficial participation. Joint enterprise refers to the need for the group to respond to a command for itself. Finally, a shared repertoire involves the, “ routines, words, tools, the ways of doing things, stories, gestures, symbols, genres, actions or concepts that the community has adopted in the course of its existence.” (19) The author

continued to summarise his framework for our social theory of learning comprising four components that are “deeply interconnected and mutually defining”. All of these should be present in actually community of practice and include:

- Meaning – Learning via experience. Members of the group discuss the experiences and create shared meaning based on these experiences
- Practice – Learning by doing. Members of this group talk about the shared ideas and resources that can sustain action
- Community – Learning by belonging. Members talk about the community process and how they learn and develop competence
- Identity – Learning by becoming. Members talk about how the learning changes who they are as an individual.

Thus, the concept of the community of practice is complex and multi dimensional and serves multiple purposes both for individuals and subgroups within the community. The key component of a Community of practice is that knowledge is transferred between individuals in a community via multiple pathways, concurrently. Effective knowledge transfer is dependent on meaningful exchanges between the members of a network in the most time efficient and effective way. There are five key factors that influence the relative success of a community of practice according to Wenger: (19)

1. The existence of a common goal
2. The existence and use of knowledge to achieve that goal
3. The nature and importance of relationships formed among community members
4. The relationships between the community and those outside of it
5. The relationship between the work of the community and the value of the activity

(Wenger later added that achieving this year to go of the community requires a shared repertoire of common resources, for example, language, stories and practices.)

Virtual communities of practice can play a socialisation role to the same extent as a real community does. (66) Crucially this can only occur if the physical face-to-face interaction that takes place within a physical community of practice is replaced with a virtual face-to-face interaction. This is done via technology such as a virtual assistant. Virtual communities of practice are a recent phenomenon, with no studies having been performed evaluating their effectiveness. Parboosingh suggested that if I study was to be performed focusing on effectiveness, emphasis should be given on how the community of practice takes advantage of this technology, rather than how this technology affects the community of practice. (67)

In educational practice, a community of practice should aim to achieve the following: (68)

- Ensure that all learners are engaged in a culture that is conducive to learning
- Provide opportunity for learners to identify with their peers and also their supervisors
- Encourage a wide ranging discussion in order to explore shared theories
- Provide a means of discussion for learners; this may take the form of an interactive forum as the primary channel for communication
- Facilitate High quality supervision ensuring adequate access to teaching and learning
- Develop high-quality interactions and supervision, stimulating dialogue between learners and supervisors

A recent study demonstrated that students within a community of practice could perform comparatively with students assigned to academic medical centres in written examinations. (69)

1.4: The Differences Between Adult And Child Education

There has been an increase in the number of individuals attending university as well as an increase in the number of mature students embarking on their first or second degrees. Understandably, this has raised the question of whether adult students learn differently to children and if so, how are they best taught?

It is now universally agreed that adult education is very different from child education and requires a teacher with a different skillset to perform well. (70) In 2002, Sandra Kerka examined the topic of teaching adults and performed a literature review. (70) The review emphasised that adults need the learning process to be “meaningful” and they were much more likely than children to be self directed in their learning which may lead to them being much more self-motivated. They often adopt a problem-centred approach to learning rather than content-centred, used commonly in child education. (70) Perhaps most importantly of all, adults often choose to study and choose to study a subject that interests them, rather than being forced to study a generic topic.

Kerka highlighted the fact that children will at some point in their development (normally in their teenage years) become adults and this stage will not be the same for every individual. Thus, differences between adult education and child education are not necessarily distinct in students around this age group. (70) Evidence exists demonstrating some children will be highly motivated, independent learners and these individuals will show many of the characteristics more commonly associated

with adult learners. Conversely, it is sensible to assume that not every adult learner is likely to exhibit traits associated with adult learning all of the time.

The review also highlights the differences between the concepts of Learner-centred and content-centred (also referred to as teacher-directed) models of education. Cervero and Wilson stated that it is of paramount importance to "involve adult learners in identifying their educational needs" if they are to thrive in the educational environment. (71) This approach to adult education is called Andragogy, which aims to provide "a relaxed, trusting, mutually respectful, informal, warm collaborative and supportive learning environment." This contrasts with more conventional teaching in schools where children and adolescents are given information to learn from teachers. Students then acquire knowledge passively via this interaction with the teacher. The reason children are taught this way, at least initially, is because the basic concepts of reading, writing and communicating are seen as crucial in life and must be mastered before deciding their own learning curriculum, for example, when choosing what subjects to study in secondary school.

There is growing acceptance that the learning preferences of adults are different to children, however, there is still a lack of learner-centred techniques being implemented by teachers and educational bodies. Instead, many choose to adopt the teacher-directed method, supplemented by an altered relationship with learners. (72) Consideration that the learning preferences of adults may be very different to children is very important, as adults may have a far greater "results-based" mentality and base their decision to study at an academic institution having first considered what kind of teaching methods suit their learning style best.

Merriam et al. discussed the differences between adults' and children's' learning in three areas: context, learner and learning process. (24)

- Context – Children are dependent on others for their wellbeing, while adults have assumed responsibility for managing their own lives. Typically, being a learner is only one of several roles played concurrently by adults. Additionally, the principles that have guided approaches to teaching children, and which have been applied to learners of all ages, have focused on generalised learning in the school setting. (73) In contrast, adults generally learn and function in settings where situation-specific skills are required to resolve relevant problems.
- Learner – As Knowles has described, (12) there are significant differences between adults and children that must be addressed in the learning process. These include the need of adults to be self-directing, their large reservoir of experience, the relationship of their readiness to learn to their social role, their desire for knowledge that can be immediately applied to current relevant problems and their internal motivation to learn.
- Learning process – Three non-cognitive factors have been shown to affect adult learning; pacing, meaningfulness, and motivation.

1.5: The Increasing Role Of Technology And Computers In Education

It has been suggested that the average time spent online per week per UK adult was twenty hours. (74) With this increase in computer literacy, it is unsurprising that the role of technology and computers in education is a growing area of interest for researchers.

The use of computers in the provision of general education is not a new concept. As early as 1991, there was enough published research to allow meta-analysis of data. Kulik and Kulik (1991) demonstrated that what they described as “Computer-Based Instruction” (CBI) had a positive effect on the performance of students. They included 254 studies in their meta-analysis and showed that students who had

utilised CBI achieved better examination results by a statistically significant 0.3 standard deviations. In terms of student satisfaction, reaction to the use of computers to supplement learning was very positive. As an aside, students reported that they felt the time required for teacher input was reduced in relative terms. (75)

Following this meta-analysis, two concepts which were developed and subsequently heavily researched were Computer based learning (CBL) and Computer Aided Learning (CAL). Computer based learning refers to computer programmes representing the sole method of teaching a curriculum. It has limited use in higher education where abstract concepts often require a teacher to elaborate and some form of discussion. Computer assisted learning on the other hand, refers to the use of computer programmes within a curriculum as an adjunct to other teaching methods, such as tutorials or discussion forums. (76) In other words it supplements the teaching instead of replacing it. In 1992, Cohen conducted another meta-analysis on the use of computer assisted learning, specifically in relation to educating health professionals. Forty-seven studies were included with thirty-two suggesting that the use of computer-assisted learning resulted in better examination performance. Fourteen studies demonstrated statistically significant differences between the computer-assisted learning and conventionally taught students. (77)

More recently, in 2009 a systematic review and meta-analysis was performed by Al-Jewair et al. and was published in the Journal of Dental Education. (78) It investigated the use of computer assisted learning in the teaching of Orthodontic diagnosis and treatment planning. They concluded that computer assisted learning is: “at least as effective as conventional modes of orthodontic learning, and adds an additional small (4-10%) but significant gain in student knowledge acquisition”. There is no denying that this is a growing area of research perhaps due to modern advances in technology. (79–82) Further studies are needed to examine other

important outcomes that have not been published, such as the efficacy of computer assisted learning on performance in clinical procedures, cost-effectiveness, time efficiency, knowledge retention, the burden computer assisted learning imposes on students, and its effect on educators in terms of attitudes and effort involved.

Following the success of computer assisted learning, many Universities have become much more open to using computers as an adjunct to teaching. In recent years, efforts have been made to define the role that computers play in an effort to maximise the benefits for the learner. This has resulted in the emergence of the "Flipped Classroom" concept.

1.6: The Flipped Classroom Concept

The flipped classroom method of teaching involves knowledge being acquired outside of the classroom. When students attend class, application of the acquired knowledge is applied to different problems / questions in the supportive environment of the classroom with a teacher. In times gone by material would have been given to students in paper form or they would have been provided with a reading list. Today, material can be delivered in different mediums such as video, PowerPoint presentations, podcasts and links to further reading.

In the 1990s, Professor Eric Mazur from Harvard University developed 'peer instruction' where he gave students material to cover and reflect on prior to attending class. He used the class time to encourage deeper cognitive thinking via peer interaction and instructor challenge. He called this "just in time teaching". (83)

This model was later expanded to include technology. At the International Conference on College Teaching and Learning in 2000, Baker gave a presentation

entitled, “The Classroom Flip: Using Web Course Management Tools to Become a Guide by the Side”. The ‘flip’ concept was outlined and emphasised the role of ‘learning management systems’ in delivering material to students before class. The role of the teacher was described as facilitator.(84) Subsequent research focused on the notion of ‘inverting the classroom’ as a means of providing an inclusive learning environment in which personalised coaching and mentoring was the norm. (85)

Lage et al proposed that the way that students prefer to learn and the actual methods being used to teach them might have been producing less than ideal results in terms of examination performance. As a result they published what would become a landmark paper entitled, “Inverting the classroom”. (85) They trialled their concept at Miami University when teaching undergraduate Economics students. As the ‘Inverted classroom’ name suggests, conventional teaching methods were reversed. Conventional teaching involves a lecture or presentation followed by homework, which in their paper simply involved “personal study”. In Miami, students were given access to video-recordings of lectures that were available before the designated class. Later attendance in a classroom was compulsory. The lecturer asked if any questions had arisen from the video-recordings provided. After a short question and answer session, students were asked to complete a task.

In their paper, they described how different individuals learn in different ways and students can be categorised according to this style, using tools such as the Grascha Riechmann Learning Styles Questionnaire. The six categories are: Avoidant, Collaborative, Competitive, Independent, Dependent and Participant learners. (86) Avoidant learners prefer not to attend class and do not engage with teachers; collaborative learners work best as part of a team; competitive learners learn in order to perform better than others in the class; Independent learners work best on

their own; dependent learners tend to rely heavily on a teacher figure to transfer knowledge; and participant learners like to get the most out of classes and want to take part in as much of the course activity as possible. Interestingly, the authors proposed that the ‘Inverted Classroom’ method of teaching gives opportunity for all six types of learner to thrive. Although this appreciation was not novel, it was still relatively progressive.

In short, the ‘Inverted Classroom’ method of teaching allowed each individual to learn as they wished. Some naturally gravitated towards discussion and group work, whereas others decided to watch the video-recordings in their own time and at their own pace. Crucially, feedback concluded that student satisfaction using the inverted method was greater than convention methods.

Later the term “Flipped classroom” was used interchangeably with “Inverted Classroom”, however, essentially these terms are the same thing.

Reported advantages of flipped-classroom are that students can learn at a time that is convenient for them and in an environment where they feel comfortable. They can also acquire knowledge at their own pace, pausing if required in an attempt to understand more complex ideas. In a formal setting, the pace of information delivery is very much set by the teacher. Students may not feel comfortable to ask the teacher to repeat complex statements or ideas to help them understand. The usefulness of being able to rewind video or voice recordings for students with hearing impairments or for those whom English is not their native language has been described as “invaluable”. (87)

Once knowledge acquisition has been performed, application of knowledge to problem solving tasks is best performed under the guidance of an instructor. (88) In

the flipped classroom model, the entirety of the teacher's time will is available for application of knowledge to problem solving instead of some of the time being wasted for knowledge acquisition. The teacher may also be better placed to detect situations where students have made errors during the acquisition stage or find application difficult. Finally, the teacher may choose to allow students to engage in discussion inside the classroom. This will create a collaborative learning approach to learning that will be conducive to students developing further via group participation, (89) a phenomenon that was originally described by Ertmer & Newby in 1993. (89) This is a key feature of the educational theory of social constructivism described by Fenwick. (90)

The flipped classroom method of teaching has its disadvantages. It essentially relies on students having access to a computer, which may not be possible for students from poor socio-economic backgrounds. This may disadvantage them at least in relative terms if the performance of other students in the cohort improves. It also relies on students acquiring the knowledge outside of the classroom. This is probably the most obvious disadvantage particularly if the students lack motivation. Another disadvantage is that it places an additional requirement for teachers to prepare video or voice recordings online and ensure every student has easy access to it. If no information technology support is available, teachers will be left to shoulder this additional information technology burden.

Chapter 2: Literature Review

Two key principals are required for the adoption of any new andragogy or pedagogy. The new teaching method should:

- Result in equal or even improved examination performance
- Be met with student satisfaction that is equal or even an improvement upon any existing method that is currently in use.

2.1: Quantitative – Examination Performance

2.1.1: Quantitative – Non-Medical / Non-Dental Research

In Economics, Calimeris and Sauer undertook a randomised study to quantify the effect of the flipped classroom on the learning outcomes of undergraduate economics students. Students were randomly allocated to either the traditional teaching group or the flipped classroom group. The outcome was an initial period where the performance of the flipped classroom group was not as favourable, followed by better performance resulting in substantially improved examination results by the end of the study. (91)

In a carefully designed randomized trial, Foldnes reports clear quantitative gains in a flipped mathematics class relative to traditional lectures. (92) Another studies relating to also demonstrated the same thing. (93)

In Life Sciences, Gross et al. also investigated student performance using flipped classroom versus traditional lectures. One group were given the flipped course and the other group were given used traditional lectures with additional online activities. The authors reported a 12% better exam performance in the Flipped Classroom cohort. Underperforming students and female students in particular were shown to benefit to a greater degree. (94)

In Equine Science, Mortensen et al. compared the results of a flipped classroom cohort with previous cohorts that were taught using traditional lectures. The authors were adamant that there was no difference between the groups in terms of intellectual capacity and therefore concluded that improved performance, critical thinking, and satisfaction could all be attributed to the flipped classroom method. Despite the authors best efforts to ensure intellectual similarity between the groups, using previous cohorts of students was a important confounding factor. (95)

In Biochemistry, Ojennus investigated knowledge gain using the flipped classroom method when teaching undergraduate students. There was no explanation of how the authors allocated the students into the respective groups. Twenty-nine students were allocated to the conventional teaching group and twenty-five to the flipped classroom group. The study concluded that there was no statistical difference between the results of the two groups. However, the author clearly stated that the flipped classroom cohort consisted mainly of junior students while the conventional teaching group was mainly senior students. This was a potential source of bias that may have affected the results. (96)

In Chemistry, a study by Yestrebsky (2015) investigated student performance relating to the flipped classroom model. This was a large study involving 415 in one arm and 320 students in the other. The arm consisting of 320 students served as the control group and was taught using traditional lectures. The group consisting of 415 students was taught using the flipped classroom method. Interestingly, the author split the traditional lectures into four, fifteen-minute sections as they felt attention span diminished substantially beyond this time. End of term examination scores between the two groups were compared. The authors noted, “Students in the

flipped classroom making a final grade of A or B is increased in comparison to the traditional group." (97)

In 2015, O'Flaherty et al published a scoping literature review based on the implementation of the Flipped Classroom model. A scoping review, as the author points out, differs from a systematic review in that it does not look to answer a precise question, rather, "it is used when there is a paucity of rigorous evidence and aims to highlight the relevant literature and map the key concepts". Eight electronic databases were searched along with hand searching and search of the grey literature. Twenty-eight studies were included in the final review. The author highlighted "the notable absence of literature from Europe" as twenty-three were from the USA and only one from the UK. O'Flaherty commented that an initial financial and time investment is required to plan and develop flipped classroom sessions, however, "the flipped approach showed increased academic performance as measured by improved examination results and/or overall improvement in pre-test to post-test scores, and/or course grades compared with historical controls" The review concluded that the key elements to successful implementation of the flipped classroom model were: "Content in advance, instructors awareness of student understanding and higher order understanding during class-time". (98)

2.1.2: Quantitative – Medical Research

In 2015, Betihavas et al. carried out a systematic review of the flipped classroom method in Nursing. Only four papers were included in the review with three comparing traditional teaching with the flipped classroom model. Two papers reported no significant difference in final exam scores between the two groups. The third one reported significantly improved exam scores for the flipped classroom method. (99)

Liebert et al. compared a twelve-month module in Surgery taught using a flipped classroom method versus a previous cohort of students taught using traditional lectures. In line with previous studies, there was an initial acclimatisation period where student performance using the flipped method initially suffered but was shortly followed by an improvement in examination results for end of term assessments with the flipped classroom cohort performing better than the group that received conventional lectures. (100)

In Pharmacy, a study by Wong et al in 2014 investigated end of term examination performance of 101 students and compared it to the previous years' cohort of 103 students who were taught using traditional lecturing methods. The authors stated that the two cohorts were matched in terms of demographics and age and both groups were examined on three separate occasions. The results showed that students in the flipped classroom cohort produced significantly higher overall results. In the first set of exams, both groups performed fairly evenly. However in the second and third set of exams, the flipped classroom group performed considerably better (89.6% versus 56.8% and 89.2% versus 73.76%). (101)

2.1.3: Quantitative – Dental Research

Specifically in relation to dentistry, the use of the flipped classroom method is scarcely reported, with only two papers in existence.

Park and Howell's 2015 study at Harvard Dental School incorporated both pre- and post-test assessment but this was performed more as a teaching tool and the results were not clearly discussed. Furthermore the authors concluded that they

were working on an outcome assessment method to conduct further research in the future. (102)

2.2: Qualitative – Student Perceptions Using The Flipped Classroom Method

As discussed in chapter 1, student satisfaction has become a topical issue in recent times due to an almost commercialisation of Higher Education courses, with students acting as consumers. (103) One would expect student satisfaction to increase if the learning preferences are being met.(85) It is reasonable to assume that in order for Institutions to adopt a flipped classroom method of teaching, the primary factor driving this change would be student demand for this type of teaching. There has been a large amount of research conducted looking at student satisfaction using the flipped classroom method at the Higher Education level.

A large part of the research on student perceptions of the flipped classroom is based on quantitative analysis of student surveys (104–106) and not actually true qualitative studies in a classical sense.

O'Flaherty and Phillips argued that 'Constructs such as engagement are not always easily reduced to measurable items on survey instruments or a reflection of examination performance and so warrant further investigation'. (98) The 'further investigation they are referring to, inferring qualitative work.

Abeysekera and Dawson conclude that more qualitative research investigating how students experience the flipped classroom is needed (107), while a recent review by DeLozier and Rhodes emphasises the need for studies investigating whether

students' approaches to learning change when enrolled in a flipped versus a lecture-based classroom. (108)

Finally, in 20 studies published from 2013 to 2015 on the flipped classroom analysed by Zainuddin and Halili, not a single study was found to employ a qualitative methodology. (109) On the contrary, the authors found that the most frequently used methodologies in flipped classroom research were mixed methods approaches, followed by the quantitative approach. (109)

2.2.1: Qualitative – Non-Medical / Non-Dental Research

In mathematics, Tawfik and Christopher analysed in-depth interviews to gain understanding of how students perceive the use of a problem-based learning approach in a flipped classroom context. (110) They focus particularly on the use of videos for self-directed learning and for solving ill-structured problems. The authors were mainly concerned with problem-based learning, and studied how this may be implemented in a flipped classroom framework. (110) They identified four themes: relevance, reciprocal learning, teacher as facilitator, and self-efficacy. Of these, teacher as facilitator and self-efficacy are particularly relevant for understanding of student perceptions of the flipped classroom.

In Marketing, Nguyen et al. used thematic analysis of in-depth interviews of students involved in a class where only some modules were flipped. (111) They identified three underlying dimensions to the flipped classroom: preparation, interaction with teacher and learning outcomes.

In Business, Findlay-Thompson and Mombourquette analysed interview data from seven students, where one third of the course was flipped, and report a mixture of positive and negative responses to the flipped classroom. (112)

Teaching different languages has traditionally involved students learning a foreign vocabulary (in a classroom with a teacher) and then creating sentences from this vocabulary thereafter. Theoretically, using the flipped classroom method of teaching could be used successfully as learning the vocabulary could be done at home and the more complex task of creating phrases and sentences could be done under the guidance of a teacher in a classroom. The use of the flipped classroom model in investigated by Evseeva et al (2015). (113) The study did not compare the flipped classroom model with traditional teaching but instead offered a review of the flipped classroom model. An evaluation from both students and teachers was also investigated. The student survey found that 85% liked the idea of using the flipped classroom method into their learning. The remaining 15% reported IT difficulties, lack of time at home for study and poor self-discipline. Teachers cited a flexible timetable, increased student involvement and improved academic performance as important advantages.

A 2015 study by Calimeris and Sauer, compared the exam results of undergraduate students taught Economics using the flipped classroom model versus traditional teaching methods. Student perceptions were also investigated. Students were randomly allocated to one of the teaching methods and concurrent 55-minute lectures were given. The students were aware they were part of a teaching methods comparison but they did not know which was the treatment group and which was the control. The author concluded that the majority of students enjoyed the flipped classroom model and that most would prefer a curriculum taught in this way. Students enjoyed learning at their own pace and could repeat videos if needed. In

addition, they learned about themselves as learners. Some discovered they quite naturally took ownership of their learning and felt they could work more effectively using the flipped classroom model. Looking at the amount of time spent learning, 45% said they spent more time learning when using the flipped classroom model while 48% said they spent the same amount of time learning. (91)

In Mathematics, a mixed methods study conducted by Strayer used field notes, interviews and focus groups to study differences in culture between a flipped classroom and a lecture-based classroom, and identifies types of activity, homework dynamics and classroom dynamics as three areas for student interaction. (114)

Gross et al. also investigated the impact of using of the Flipped Classroom method when teaching undergraduate students physics. The title of the session was, “Classical thermodynamics, equilibrium phenomena, reaction kinetics and statistical and quantum mechanics”. A comparison of student performance was performed over five-years. Three years involved traditional lecture based teaching and two involved flipped classroom teaching. Despite higher academic scores, the students in this study did not feel they learned more using the flipped classroom method. They did, however, feel that the flipped classroom method helped them develop into more independent learners. (94)

In 2015, Moraros et al. investigated the impact of the flipped classroom method of teaching in Masters level Epidemiology students. Sixty-seven students took part in the study. 89% of whom described as feeling either comfortable or very comfortable with computers and the internet. For two terms, students watched online video lectures and learnt from a textbook prior to attending class. Tasks set during classroom hours included quizzes, problem solving questions and presentations. The study measured the students’ perceived effectiveness of the flipped classroom

model at three separate points in time. The overall effectiveness of the flipped classroom model was rated highly by the students. Improvements suggested by the students included poor audio quality of the video recordings and that the video recordings were too long in length. (115)

2.2.2: Qualitative – Medical Research

Again in 2015, Das and Sarkar, published their paper, “Systems of Measure & Dosage Calculation-Flipped Classroom Session”. This was a slightly different study where the authors aimed to establish whether the flipped classroom method of teaching could reignite enthusiasm, engage attention and facilitate participation among medical undergraduates for their proposed topic. The results showed that the method was successful in that engagement was improved. (116)

A recent systematic review of the flipped classroom in medical education included quantitative meta-synthesis of nine studies (eight of which were in an undergraduate curriculum) along with qualitative meta-synthesis of 46 studies. (117–119) Using Kirkpatrick’s framework to describe their findings, (118,119) the authors concluded that, in general, learners’ perceptions of the flipped classroom (level 1 outcome in the modified version of Kirkpatrick’s framework) were positive, with students reporting greater task value and enjoyment compared to traditional lectures.

Khanova et al in 2015 looked at a five-week psychiatry/neuropharmacology course and redesigned so that the flipped classroom model to be implemented. Online modules concentrated on a particular disease and had links to webpages containing a comprehensive description for each topic with definitions and interactive assessments. Prior to the course, 72% of students preferred traditional lectures to flipped classroom. Following the course, 83% of students stated they preferred

traditional lectures. Only 28% of students agreed that modules covered prior to classroom learning was useful. Students stated that there was too much content to cover prior to the classes. A lack of guidance from Professors and typing errors in course material were listed as the main sources of dissatisfaction. This study demonstrates that the flipped classroom model must be carefully implemented; otherwise it can negatively impact student satisfaction. (88)

In 2015, Betihavas et al published a systematic review of the Flipped Classroom method in nursing education. (99) As previously discussed, they included four studies in their review and regarding student satisfaction, they reported some mixed findings. One of the studies found no difference in course evaluations using the flipped and traditional approaches. Two studies included positive feedback for the flipped model, while one paper reported the flipped classroom cohort was less satisfied.

In a study involving Medical undergraduates, the Flipped classroom model was well received. Das and Sarkar investigated the efficacy of the Flipped Classroom model for teaching “Systems of Measure & Dosage Calculation”. Of the 362 students that took part in the study, all of them felt that the flipped classroom model allowed them to better understand the subject. They also stated that further sessions would be beneficial in other areas of their curriculum. (116)

In the prospective cohort study published by Liebert et al. using the flipped classroom concept when teaching eighty-nine third-year medical students completing their “surgery core clerkship”, 89% of students reported they were “very” or “extremely” satisfied with the flipped classroom method of teaching. One consideration gained from this study not really discussed in any other studies was the total time spent teaching was similar for both teaching methods. However, the

proportion of total student time spent in active learning increased from 33% to 60% in the flipped classroom model. (100)

A study by Morgan et al. is one of the few studies to specify the rate of student adherence to watching the online content when using the flipped model when teaching undergraduate medical students. The authors reported 80% of students viewed the video recordings prior to the classroom session. 94% attended the classroom session. Student satisfaction was very high for both the online and classroom content. Students commented positively on the drawings, videos and general usefulness of the teaching methods employed. (120)

In 2014, Gilboy et al. investigated the impact of the flipped classroom method in teaching Nutritional Science. This study was also a description of implementation and an examination of student feedback. No effort was made to compare examination performance with a control group. Out of 196 students, 76% of students preferred watching a video recording of a lecture than actually attending the lecture itself. 62% believed they learned the lecture content more effectively with the video recording and 56% believed they learned how to implement the material learned more effectively. (104)

Finally, a scoping review of the literature by O'Flaherty et al in 2015 emphasised the importance of communicating what is expected of students in the knowledge acquisition phase prior to classroom attendance. Although some students find it easy to accept responsibility for their own learning and thrive in this environment, others may find it very frustrating and feel unsupported particularly during the knowledge acquisition phase. (98)

2.2.3: Qualitative – Dental Research

The literature search undertaken found very little reference to the flipped classroom model being used in dentistry. One of the few publications was by Park and Howell in 2015, which took place at Harvard University. 85% of students were found either to “definitely” or “possibly” like to have more of their training taught using the flipped classroom model. Students found the flipped classroom sessions “more fun, interactive, and collaborative” than traditional lectures and that the quality of the interaction between teacher and their peers was better than in a traditional lecture format. 84% of the students reported that the flipped classroom activities encouraged peer teaching and were in favour of this. (102)

Very recently, Crothers et al. in 2017 designed an online learning environment for undergraduate students in their paper, “The Flipped Classroom for pre-clinical dental skills teaching – a reflective commentary”. Published in the British Dental Journal, the authors developed “an extensive suite of electronic teaching resources including images, animations and audio / video recordings of clinical procedures”. Students were encouraged to bring their own personal smartphones or tablet devices with them into the classroom so that they could explore resources as they were practising their operative skills. The design gained “very positive feedback from students”. The students commented that the video recordings were “invaluable”. (121)

2.4: Summary of findings from Literature Review

1) Teaching adults requires a different approach to teaching children.
2) An increasing number of adult students entering higher education have resulted in student satisfaction being explored in many studies as institutions adapt to this increase in number.
3) The use of computers in education is growing is now well accepted.
4) The flipped classroom method results in equal or improved academic performance.
5) The flipped classroom method results in equal or improved student satisfaction.
6) There is limited evidence regarding the implementation of flipped classroom model in dentistry.

Chapter 3: Rationale for Research

The importance of providing students with university courses that not only allows academic achievement but also provide them with a course that they are extremely satisfied with, is extremely important in the modern day, where students are effectively consumers in an educational marketplace.

The Flipped classroom method of teaching has been shown to produce improved examination results across many disciplines as well as improved levels of satisfaction.

There has been no research conducted looking at the effects of implementing flipped classroom teaching to undergraduate dental students, studying orthodontics and learning about how to manage orthodontic emergencies commonly encountered in general dental practice.

Chapter 4: Aims and Objectives of Study

4.1: Aims

The primary aim of this study is to establish whether the flipped classroom method of teaching orthodontic emergencies produces better examination performance and improved levels of confidence among undergraduate students versus conventional lecture based teaching.

4.2: Objectives

This aim raises the following core research objectives:

- Use the existing virtual learning environment "VITAL" (Virtual Interactive Teaching At Liverpool) and allow students to learn using the flipped classroom method of teaching. Specifically, how to manage the most common orthodontic emergencies via online videos containing links to external websites, reading lists etc.
- Compare formative examination results of the flipped classroom group versus the group receiving the conventional lecture
- Identify key themes or concepts that permeate the responses of the students in focus groups when exploring their perceptions of both forms of teaching.
- Form conclusions regarding the success of the flipped classroom method drawing on the results of both the quantitative and qualitative data.

Chapter 5: Null Hypothesis

The Null Hypothesis is that there will be no difference in examination performance, nor student satisfaction between the test and control groups against the alternative hypothesis of a difference.

Chapter 6: Methods

6.1: Consent

A presentation was given to all fifth year students prior to the commencement of this study and after ethical approval was gained from the University of Liverpool. This described:

- The purpose of the study
- Expected duration of the study
- Procedures of the study
- Information on their right to decline or withdraw from the study
- Foreseeable consequences of withdrawing or declining from the study
- Potential risks of taking part in the study
- Prospective research benefits of the study
- Whom to contact to answer any questions they might have

An information pack (appendix 1) was given to each student. Two weeks was given for the students to think about whether they would like to participate in the study. Students then had to sign a register to actively 'opt in' to the study.

6.2: Study Design

The final design of this study was: a fully mixed methods randomised controlled trial, with a sequential qualitative component of dominant status.

When considering the qualitative component, different purposes of mixed methods designs have been described. (122) It is essential that the correct purpose be selected for the correct circumstances.

In 1989, Greene suggested 5 main purposes. (123) The first purpose is for triangulation. Triangulation is where convergence or corroboration of findings is sought from the different methods. The second is for complementarity, where different methods are used to assess different study components or phenomena in order to assess the plausibility of identified threats to validity, or to enhance the interpretability of assessments of a single phenomenon. The difference between this and triangulation is that it seeks to enhance already accepted results and not attempt to confirm the result. The third is development, which aims to use the results from one method to help develop another method. It increases the validity of constructs and enquiry results by capitalising on inherent method strengths. The fourth is initiation, which seeks the discovery of contradiction from one method to another. Finally, the expansion purpose seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.

In this study the purpose of the qualitative research component was for complementarity. In other words, one may anticipate that improved examination performance will also be observed alongside an improvement in satisfaction with the teaching methods received. Of course these are two similar but completely unrelated concepts, however, they are much more interesting when considered in combination.

Partially mixed studies are described as studies where both the qualitative and quantitative aspects of a study are conducted separately before mixing occurs at the data interpretation stage. Whereas, a fully mixed method design has mixing occurring in either one or all of the following: the research objectives, the types of

data, or analysis and inference. If the timing of the different phases of data collection are performed at the same time, then the timing is said to be concurrent. If it is performed at a different time, the timing is said to be sequential. Finally, whether each methodology is given equal status in the chosen design or whether one aspect is given priority, should be stated from the outset.

The reason that the decision was made to give the qualitative component dominant status over the quantitative component was because students may underperform on examination yet perceive the intervention as being much more positive.

Thus, the final design of this study is a fully mixed-methods randomised controlled trial, with a sequential qualitative component of dominant status.

6.3: Participants

The sample population for this study was Final year undergraduate dental students at Liverpool University from December 2017 to March 2018. Eighty students were invited to participate in the trial with sixty-one agreeing to take part.

6.4: Inclusion Criteria

Inclusion criteria was as follows:

- Fifth year LUDH undergraduate Dental Students at Liverpool University Dental Hospital scheduled to undertake teaching on the subject of Orthodontic Emergencies
- Inclusion was permitted through volunteering

6.5: Exclusion Criteria

The exclusion criteria were:

- Students who are repeating their fifth year of the BDS degree program

6.6: Interventions

The interventions were as follows:

1. The “conventional lecture group” attended a didactic lecture describing the ideal management of orthodontic emergencies. This lasted 60 minutes in length and covered six common orthodontic emergency scenarios.
2. The “flipped classroom” group were granted access to a dedicated area of their virtual learning environment (VLE) where six videos were available to watch. These videos covered the same scenarios and contained the same information as the lecture, meaning only the style of teaching was different between the two arms. The videos created were: wire causing trauma to soft tissues, lost modules, debonded bracket, hypersensitivity reactions, inhaled/ingested materials and lost/broken retainers.

Videos

The videos were filmed using a digital SLR camera, various sets of plastic dental models, various appliances and different instruments. The videos were edited and paired with commentary using a microphone on iMovie, a video-editing app and were accessible via a wide variety of devices. Two weeks later, participants in this group then attended a practical session, where they practised the skills described in the videos. These were essentially the practical skills they would be expected to perform once graduated.

6.7: Outcome Measures

6.7.1: Quantitative

The primary outcome measure for the quantitative data was examination performance, which was formatively assessed by completion of 20 single best answer questions. 15 questions covered orthodontic emergencies and 5 questions

covered orthodontic questions. Students were made aware that the examination was formative in nature. The questions were unseen by the participants in previous years of study and were standard set from previous final year student cohorts. The decision was made to include 5 questions relating to general orthodontic topics so that a comparison between the general performance levels of the students in each arm could be made.

6.7.2: Qualitative

The primary outcome measure for the qualitative data, perceptions of the flipped classroom method of teaching were explored via semi-structured, open-ended focus group interviews. This is discussed in more detail in chapter 6.11.2.

6.8: Sample Size

The sample size was dictated by the number of students in their final year and was therefore a convenient sample.

6.9: Randomisation

6.9.1: Sequence generation

The method of generating the random allocation sequence was done by assigning each eligible participant a number. A statistician (not involved in the recruitment process) generated the random allocation sequence using computer generated random allocation.

6.9.2: Allocation concealment mechanism

Allocation was concealed from the main researcher and all participants until 1 month before the interventions were due to take place. This was done to allow participants in the flipped classroom group 1 month to learn the material at home before the class.

6.9.3: Implementation

Concealment was maintained by creating generic email threads with each student being sent a 'basic carbon copy'. They were therefore unable to see who else was copied into the email. Details about when and where to attend was sent. An administrative assistant not involved in the study, created these email lists.

6.10: Blinding

Neither the main researcher nor the participants were blinded however measurement of the quantitative exam was performed using a machine and was therefore objective.

6.11: Statistical Analyses

6.11.1: Quantitative Analysis

The results for each student from the formative single best answer examination was entered and analysed using Statistical Package for Social Sciences software (IBM SPSS Statistics v.22). A t-test was used to determine whether there was a significant difference between the means of the two groups using the normally distributed data. The significance level was set at $p < 0.05$ and the overall standard deviations were calculated for each arm.

6.11.2: Qualitative Analysis

Perceptions of the flipped classroom method of teaching were explored via semi-structured, open-ended focus group interviews, in a non-clinical area, with no time constraints. The main researcher, who had completed one module of a formal qualitative research methods course run by Oxford University, facilitated the focus groups. The mixed method approach purpose was to seek/provide complementarity, where the similar but distinct entities of exam performance and levels of satisfaction would be explored to enrich our understanding of the effects of flipped classroom

teaching. Dominance was given to the qualitative component due to the limited nature of the formative quantitative exam. In other words, students who had the flipped teaching may perform poorly in the exam due to the limited number of questions, lack of revision etc., when in fact; they may consider it to be a superior method of learning. Thematic analysis was used to allow an overview of the data from the transcripts, facilitating visualisation and further examination. Thematic categories were labelled using descriptive terms, which were provided by the respondents, with others driven by questions on the interview guide.

Each focus group had a mean number of 7 participants per focus group with approximately equal numbers of males, females and graduate entrants. Participants were reassured that anonymity relating to their responses would be maintained at the start of each focus group. A topic guide was designed as an aide-mémoire to improve the consistency of data collection during the focus group interviews and ensure salient issues were covered systematically. The topic guide was annotated contemporaneously with notes relating to line of enquiry. Flexibility was permitted in this topic guide. A diary was kept and was immediately added to after each focus group. This related more towards personal performance of the main researcher facilitating the focus groups and also details about interesting responses from the students, whether this changed the direction of the conversation or the line of inquiry, student body language, participation etc.

“Microscopic” Analysis

Microanalysis is the detailed line-by-line analysis necessary at the beginning of the data analysis stage of a study to generate initial categories with their properties and dimensions and to suggest relationships among categories. It is a combination of open and axial coding. Each transcript was read twice to increase familiarity.

Microscopic examination helped generate initial categories and allowed superficial relationships among categories to be identified.

Included in this microscopic examination are two major aspects of analysis: the data, be it the participants recounting of actual events and actions as they are remembered or texts, observations, videos, and the like gathered by the researcher and the observers interpretations of those events, objects, happenings and actions. There is also a third element: the interplay that takes place between data and researcher in both gathering and analysing the data. This interplay is subjective in its very nature in that the researcher is reacting to and with the data. Although the research can try to be as objective as possible, from a practical standpoint this is not always achievable. What the research can endeavour to achieve is enhance the creative aspects of the analysis rather than drive the analysis. Experience is what alerts the researcher two significant problems and issues in the data and allows them to consider alternative explanations, recognising different concepts as they in emerge from the data.

Asking Questions and Making Theoretical Comparisons

The aim of asking questions and making theoretical comparisons is to help the analyst obtain a firm grasp of the meaning of events that might seem otherwise obscure. It is likely possible that properties can exist within the data but remain undiscovered unless careful consideration is given to an evolving theoretical analysis. A shift from simple descriptions to an appreciation of abstract concepts is required, whilst simultaneously examining basic assumptions, their biases and their perspectives. It is likely that analysis's will discover both variation and general patterns within the data, helping them form several categories, dense with information and with several links between them.

Open Coding

Open coding is the analytic process through which concepts are identified and their properties and day dimensions are discovered in the data. It is important to understand the terminology used in open coding (table 1).

Table 1 – Glossary of Terms relating to the process of open coding of the qualitative data.

Term	Definition
Phenomena	Central ideas and the data represented as concepts
Concepts	The building blocks of theory
Categories	Concepts that stand for phenomena
Properties	Characteristics of a category, the delineation of which defines and gives it meaning
Dimensions	The range along which general properties of a category vary, giving specification to a category and variation to the theory
Subcategories	Concepts that pertain to a category, giving it further clarification and specification

The first step in theory building is conceptualisation. A concept is a labelled phenomenon. It is an abstract representation of an event, object, or interaction that the researcher identifies as being significant within the data. The reason for naming phenomena is to enable researchers to group similar findings under a common

classification. At this point the researcher should endeavour to record their thoughts, interpretations, questions and directions for further data collection. This record is referred to in qualitative research as recording a “memo”, and is crucial for later interpretation.

Categories, Subcategories and Phenomena

Categories are concepts derived from the data and stand for phenomena, whereas, phenomena are important analytic ideas that emerge from the data. The most important consideration is that once concepts are getting to accumulate, the analyst should begin the process of grouping them under more abstract explanatory terms. These are called categories. Subcategories explain the when, where, why, how and so on of a category. Once a category is identified, the analyst can begin the process of developing it in terms of its specific properties and dimensions.

Axial Coding

Axial coding is the process of relating categories to their subcategories, linking the categories at the level of properties and dimensions. Essentially, it looks at how categories interlink. The purpose of this is to begin the process of forming precise and complete explanations about the phenomena. In an attempt to enhance axial coding, the entire research group considered how different issues might be grouped into broader themes/ideas before the final categories and themes were confirmed.

The Paradigm

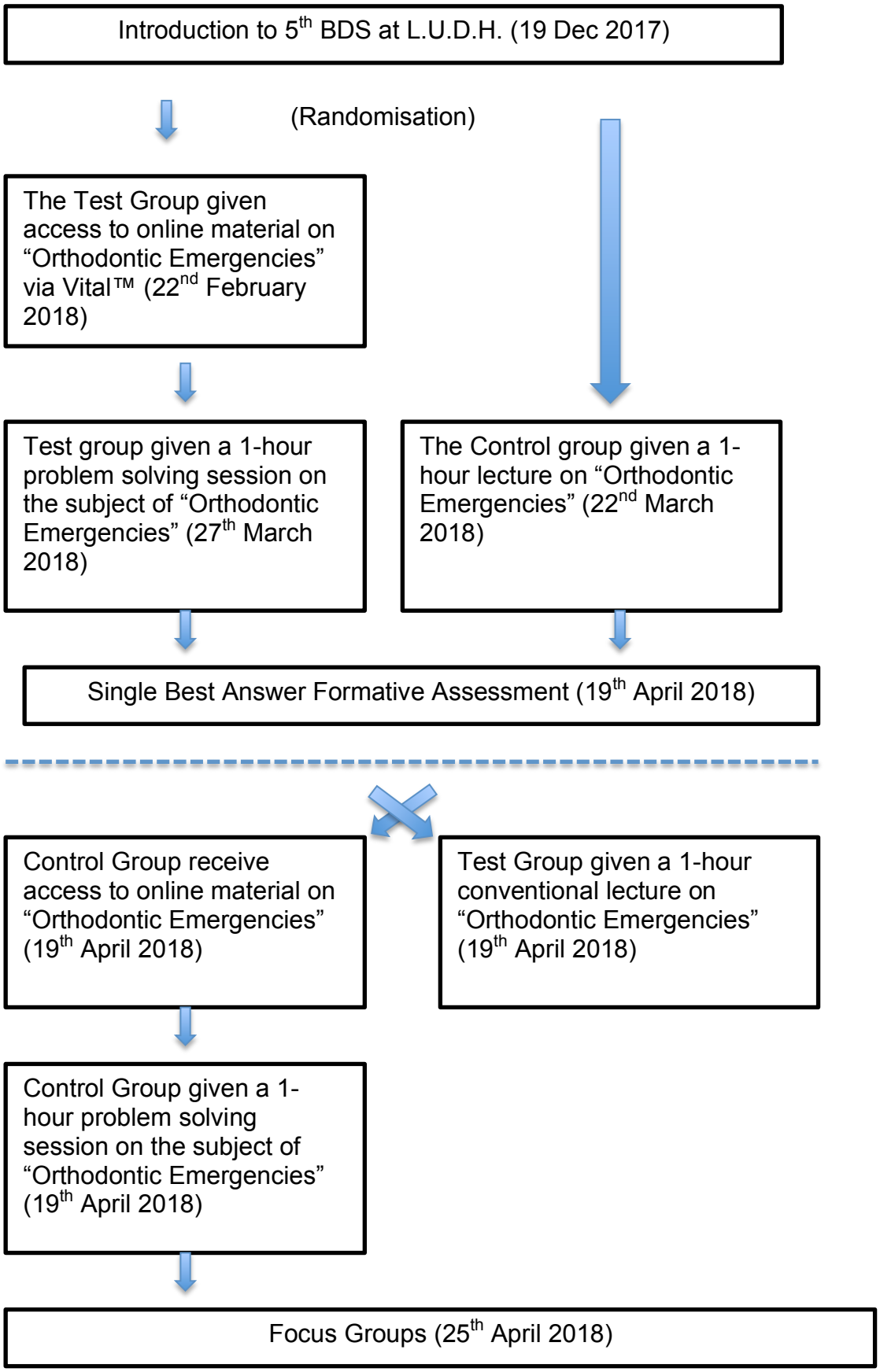
The paradigm is a perspective of the data, forming a stance that helps to systematically gather and order the data in a way that structure and process are integrated. This forms an overarching theory or theoretical perspective

One Sheet of Paper Analysis (OSOP)

To improve reliability of the qualitative findings, the content of each focus group was openly coded using the 'One Sheet of Paper' (OSOP) analysis originally developed by researchers from Oxford University. (124) Final sub-categories, categories and the proposed overarching theory were once more considered.

Chapter 7: Results

7.1: Flowchart



7.2: Recruitment

The period of recruitment took place from 7th September 2017 to 30th September 2017. The trial ended because saturation had been reached from a qualitative standpoint (no new categories were emerging from the data) and the results of the quantitative examination were complete.

7.3: Quantitative Outcomes

The results from the formative assessment were as follows:

	Conventional Group Score (n=30)	Flipped Group Score (n=31)	p-value
Orthodontic Emergencies Questions (n=15)	70.5% (SD 8.0%)	72.8% (SD 12.9%)	p = 0.532
Non-orthodontic Emergencies (n=5)	64.8% (SD 19.9%)	78.3% (SD 21.7%)	p = 0.083

7.4: Qualitative Outcomes

Seven focus group interviews were conducted with a mean participant number of seven. The mean length of each focus group was 38.8 minutes (31.27 – 47.23 minutes). The total number of pages once the focus groups were transcribed was 145 pages. Thematic analysis identified the following themes and categories:

Overarching Theoretical Perspective	Themes	Categories
Facilitating an experiential learning cycle using flipped classroom teaching	Ways in which videos encourages more effective learning	Control of information delivery Control of timing of learning Control of learning environment Improved time efficiency
	Improved engagement	Cognitive Aspects Improved cognition from practising motor skills Affective Aspects Improved confidence Safety in numbers Behavioural Aspects Improved participation and interaction
	Awareness of learning needs	Identification of preferred learning style Previous experiences using learning style Assessment style influencing learning style Teacher accessibility Relevance of material
	Proposed teaching / curriculum changes	Catering for a combination of learning styles Changing structure of learning material Changing sequence of learning material Changing physical learning environment Inclusion of external resources to supplement learning Increased clinical exposure

The original transcripts included hesitations, ‘ums’, ‘ers’ and repetitions because of their importance during the interpretation process. (125) However, for the purposes of publication, these have been removed to improve readability.

Theme 1 – Using videos for effective learning

Control of information delivery

Overall, students were very satisfied with the structure and content of the videos:

" They were just concise and they made sense, it wasn't confusing, wasn't loads of jargon or anything "

The most common reason for this was that it was possible for the students to self-regulate their learning, by pausing, rewinding or replaying the videos either in full or in part. Being able to do this allowed them to learn at their own pace and according to their individual needs. Some students inferred that this is not possible in a conventional lecture:

" (you can) pause it and make notes, it's under your control and a lot better than just being sat there. because (In a lecture) once you miss it, you miss it "

" The good thing about the video is if you miss something you can just rewind it whereas in a lecture you cant really rewind "

" because you can play them back not like a lecture where they will say something and you have missed it"

" I think having access to the videos like gives you the opportunity to go back if you have tried to learn something and you are not sure, you have reassurance there "

Having the opportunity to pause the videos also provided opportunity to reflect on the content. When acquiring new information, reflection is as an essential stage of learning. (126)

" you don't always get things the first time round like somethings that practical, I know I don't, so being able to watch something back just gives me more time to take it in rather than being expected to get it right like straightaway "

Often when the videos were paused, students tended to then access external resources in an effort to supplement their learning with additional information. The expenditure in time and effort to acquire this additional information demonstrated a desire to develop cognitively:

" you can pause it, you can Google stuff at the same time, like if it doesn't make any sense. So that's a helpful tool "

" if something occurs to you, you can pause it and do a bit extra reading at that point before carrying on, whereas if it a lecture you might forget to do that "

I think having access to the videos, in fact we actually had access, like gives you the opportunity to go back if you have tried to learn something and you are not sure, you have reassurance there
You can go over it again.
The good thing about the video is if you miss something you can just rewind it whereas in a lecture you cant really rewind.
But then the Vital doesn't work on the new IOS 11. You can use it in the browser though cant you? I don't know, I haven't tried that.
the slides are online forever so you can go back through them.
Makes revision very difficult unless you can remember everything in that lecture, there is no way of going back
I prefer that method to just sooth my style of learning learning I could watch videos when I want, can pause them
keep playing back bits of things if I don't understand it.
And pause it and make notes, its under your control and a lot better than just being sat there. Yeh because once you miss it, you miss it. You can always go back later on and look at it again, that's why the ones online were good.
It helps if you are a slow writer as well coz as we have said earlier, like you can pause it, you can google stuff at the same time like if it doesn't make any sense. So that's a helpful tool.
What would be good about it is that you could back to it, if you are like doing the course and then finish the course and afterwards when you are revising, you can go back to it, that would be the best thing about videos.
You don't always get things the first time round like somethings that practical, I know I don't, so being able to watch something back just gives me more time to take it in rather than being expected to get it right like straightaway.
But then the opposite as well, because if something occurs to you you can pause it and do a bit extra reading at that point before carrying on, whereas if it a lecture you might forget to do that.
you can go back and watch videos that for some reason was decided to put those ones on line, so I know over the last few weeks I have been watching bits of them and it has made a big difference now in the line up to revision having them there.
so you can have them and if you want to you can go back
just after having the lecture it would be good to go back to the videos.

And you can go back to them as well, its not just the one off lecture, you can go back and look at them again.
you can pause it, write it down and then actually go over it a couple of times and then resume the video
Say if you are in a lecture and you miss what the sort of teacher says, you miss it, but with a video you can always go back and if it doesn't go in you can go and start from the beginning, rewind
Also it is good way to categorise things as well, so if you just want to go back to looking how to like cut broken wires you literally go to that exact one and go through the whole thing.
yeh with the flip classroom teaching you do know it is there, so say if the lectures gone its gone, you can't revisit it where as with the videos you definitely can
Yeh because you can play them back not like a lecture where they will say something and you have missed it and
Because if you need to go back to something, just need that one thing explaining again, then you can go to it really easily.
You do like have to beef them up quite a bit by looking up external resource like I think if you really want to understand something

Control of Timing of Learning

The videos in this study were available for students to access using a computer, a tablet or a smartphone. This provided the flexibility to watch them in any location and at any time of day. Some students demonstrated insight into the fact that this made it possible for them to learn at a time of day that was more in line with when they felt greater motivation to learn than conventional teaching:

" you can time it to when you like to work best. So that if you don't work very well in the morning, you can do it when you feel you can take it in "

" I liked the accessibility of the videos and could watch them anywhere, any time "

" Well recently I have been working 9-5 during the day because I have had the time off, but usually it would be other times, I would do it at night but I'm finding I'm doing it better during the day actually "

" You can do it in your own time when you feel you can focus the most rather than a 9 o'clock lecture "

You can do it in your own time when you feel you can focus the most rather than a 9 o'clock lecture and then you have just work up or 2 o'clock and you've just had your lunch
Its not too much information and you could just break it up where you don't need to do everything at once sort of thing
(What's the negative things you don't like about normal lectures?) Timings - I just work better at night so there is nothing I can do about that
(I just work better at night so there is nothing I can do about that) *Me too*
I liked the accessibility of the videos and could watch them anywhere, any time
You can time it to when you like to work best. So that if you don't work very well in the morning, you can do it when you feel you can take it in.
I was watching it on a mac in the evening.
Well recently I have been working 9-5 during the day because I have had the time off, but usually it would be other times, I would do it at night but I'm finding I'm doing it better during the day actually.
Yeah I watched it the day before.

Control of Learning Environment

Allowing access to the videos across a variety of devices, also allowed the students to learn in settings that again suited their individual preferences:

" I liked the accessibility of the videos and could watch them anywhere "

" I was watching it on a mac in the evening "

This flexibility was well received, with students able to learn in a range of locations from familiar, formal settings like libraries to more informal settings with background noise present:

" I plugged my headphones in the library and just watched it there "

" I can't sit in silence when I work so I need to have music on or watch TV or something like that otherwise I just don't get anything done "

I reckon the good thing is like if you are on the train or something, you got nothing to read you can always bring it up on your phone sort of
I watched on my phone.
I liked the accessibility of the videos and could watch them anywhere
I plugged my headphones in the library and just watched it there.
I don't think it makes any difference having a lecture in dental school as it does having a lecture at home and learning it yourself.

Improved time efficiency

There was an overall sense that a successful method of teaching would provide students with good retention of knowledge and that this would be a time efficient process. Several students highlighted the fact that the videos were of an acceptable length (5-10 minutes each) and this actually contributed to better retention of information:

" I quite like short videos as well just like, I quite like the short videos as well rather than one big long one coz you can break it up and watch which one after a coffee you know, so when you see one like 60 minutes you just like oh I'll do it later. So 5 minute short ones are good "

" They were just concise and they made sense, it wasn't confusing, wasn't loads of jargon or anything "

" I like that they are quite short, you didn't have to sit and watch an hour lecture "

" They were short and sharp videos really and to the point, so I can remember what the facts from them were, as in a lecture it gets lost because you have got 60 minutes… someone goes off on a tangent and someone asks a question and then…"

" I think it is good that they were short, I think if they were any longer, I probably wouldn't have watched them or sort of stayed interested in it but because it is short and to the point, whereas sometimes they have got recorded lectures online but they go on like for dunno 40 minutes or so and you are sort of skipping through the slides until its over "

" If the video was like, and I opened it and it was 40 minutes, I'd think twice about doing it, but if it was short, say 10 minutes, then I would do it "

One way of ensuring time efficiency was giving the students the ability to attend the practical session pre-armed with relevant questions after having watched the videos. They could then immediately ask their questions without any sense of time being wasted:

" It is good that you would be able to come to the session with questions and would understand that you have watched the videos so less sort of time is wasted on other things, if you have got it, you have got it and you can ask your questions straightaway "

" I think it gives you like a chance to think of questions that you wouldn't think of on the spot in the lecture theatres, you have a bit more time to think about it and then ask the questions at lecture "

It is good that you would be able to come to the session with questions and would understand that you have watched the videos. Yeh yeh perfect. So less sort of time is wasted on other things, if you have got it you have got it and you can ask your questions straightaway.
They were short and sharp videos really and to the point, so I can remember what the facts from them were, as in a lecture it gets lost because you have got 60 mins.. Someone goes off on a tangent and someone asks a question and then
I like that they are quite short, you didn't have to sit and watch an hour lecture coz when they are online it just feels like a lecture theatre and someone is talking at you.
I think it gives you like a chance to think of questions that you wouldn't think of on the spot in the lecture theatres, you have a bit more time to think about it and then ask the questions at lecture
Also I'm more likely not to go to the lecture coz its online.
I sometimes also think watching videos takes a lot longer than reading lecture slides, so that's another thing that would go back to sort of if I had to prepare for a session, I am more likely to glance at lecture slides as that's a lot quicker to read than to have to, whereas a video you cant really fast-forward it, well you can, but you will miss everything. You cant skim watch a video.

If the video was like, and I opened it and it was 40 minutes, I'd think twice about doing it, but if it was short, say 10 minutes, then I would do it, so the length of time probably depends
I think it would help if there was a little key on there that told you at what time in the video certain points were coming up about certain aspects of the treatment, coz if you are troubled by something you can just skip straight to that specific moment.
(Talking about printing off and reading lectures prior to attending a lecture) I'd never do that, I'd never have the time to do that.
But before university it was completely different … It was good but wasn't efficient like now its like doing it with your hands is a lot more efficient way of learning.
Yeah I feel like you cant do it here like just writing out notes because there is too much compared to at school there wasn't much practical. I feel after first year I changed, as there was just too much to be writing.
They were short.
They were just concise and they made sense, it wasn't confusing, wasn't loads of jargon or anything, sometimes ortho is quite hard to understand.
if I go on the computer learn something like I've got the basic understanding and then I could come back and ask questions about it where I don't understand it, so those videos for me are particularly helpful coz instead of going on Wikipedia or something, I can just go straight to those videos.
So I think the thing is like if tutors did do videos it would be like a one time thing for them, in the sense that they don't have to keep on giving the same lecture again and again, year after year, they do one set of videos and if anyone has any issues then they can use the time that they would have done for giving that same lecture again and again, to answer any questions instead. That would save people a lot of time.
I quite like short videos as well just like, I quite like the short videos as well rather than one big long one coz you can break it up and watch which one after a coffee you know, so when you see one like 60 minutes you just like oh I'll do it later. So 5 minute short ones are good.
They are quite clear and sometimes we have had videos where you cant really see what is going in the mouth because it is quite a small cavity
and then the 4th year seminars but they were much more concise maybe an hour an hour and a half long and you learn in chunks which is better.
(when talking about conventional lectures) you spend a lot of your time just sifting through slides looking for something in particular when really you should just be getting on with your work which should be there in front of you. I guess.
I think it is good that they were short, I think if they were any longer, I probably wouldn't have watched them or sort of stayed interested in it but because it is short and to the point, whereas sometimes they have got recorded lectures online but they go on like for dunno 40 minutes or so and you are sort of skipping through the slides until its over.
I think it is different in our course because we are in all the time on a clinic and things like that, if you still have a time tabled session and then have say, I don't know, 3 hour long videos to watch, that's like a lot of time, so then, but in consideration to somebody who does like a humanities course, where they wouldn't have the lecture but it would just be a video, so it depends in terms of how you were using the videos, where you just kinda adamant to do a mass and it takes up a load of time and then does anybody really benefit, or is it going to be used instead of something?
Yeh, it depends if if it was a video and then the classroom would be something different, then you do gain from it but when it's a video and then you go back to do the same thing again, if it was the same thing it might put somebody off watching the video coz they think I don't need to watch it if I'm going, so it's a bit of a vicious cycle.

Familiarity with flipped classroom teaching and using videos for learning

The concept of flipped teaching was well received in part due to students being familiar with the concept. One student described that they felt a simple form of flipped teaching was prior reading before class time:

" A simple form of flipped classroom is printing off the lecture the night before and looking at it … and then when you go in, you have a better idea "

In addition and unbeknown to the authors, students had already gained experience of flipped teaching from other specialities within the same hospital:

" when we had our medical emergency week, we did a lot of pre-reading stuff and videos and we watched them before we came in and then we were expected just to brush up "

These were also well received and provide further evidence that students are positive to incorporating videos into their learning.

We have done if for other subjects like medical emergencies and extractions.
Like when we had our medical emergency week, we did a lot of pre-reading stuff and videos and we watched them before we came in and then we were expected just to brush up
Coz you know like with oral med we get the lecture recordings and then we get them and they are really useful because sometimes when we have got lots of pictures and you know like you make notes as you go along, but sometimes you cant put them together, so I find that with oral med its really useful so if you could do a similar thing for ortho that would be a really good idea.
PBL is a little bit like that isn't it, you go away, you do the reading and then you have a discussion about it.
Like some of the videos Miss McKernon did for like extraction in oral surgery and stuff, that was really good
Yeh those were good just using elevators and stuff like that
seminar based already post some questions, you already know the topics what you are covering so if you want to do some pre-reading, know what you kinda expecting
some of the lectures like that are recorded as well, so like I listen to those
the lectures for oral med are like really good so there's not much need
Yeh the university of Leeds has a pathology one, its like an interactive website thing, yeh it was good, I remember using that. the You Tube video is mainly used for 3rd year, when was doing the whole body, explaining processes like, don't know, ossification and stuff like that,
That's one thing the lectures from the ortho department have been online before the lectures which to me is really important to be able to have a glance before the lecture so I know

whats coming up and having it there during the lecture because if you are trying to make notes on something separate and then trying to put it back together afterwards.
There was some oral surgery videos for extractions and I found really useful and because it is practical and obviously when you go on clinic, its practical as well that was really useful
I have found a few oral med ones that are good. It's got its own animation that makes it, like facial swelling and then like little things will pop out and then it's like you have a little diagram of an egg shell cracking, you have little things about, I just love drawings and stuff! Colours and pictures!
A simple form of flipped classroom is printing off the lecture the night before, looking at it, not necessarily learning stuff before you go it, but actually saying we're going to talk about that tomorrow and then when you go in you have a better idea.
I was just going to say that I think last year oral med did this thing where they put like a video with the notes on the actual Vital and you had time to go away and do it yourself and then the week after you would come back and discuss it, I thought that could have been implemented last year with the orthodontic seminars, where like instead of sitting there for a hour where like vast amounts of information was just unloaded at you, you could just have a video
We do this things called RPD player, RPD designer for prosthodontics , I think that is pretty good data to pretty much lean for prosthodontics. If they did like a similar thing for ortho where just one day hands on, the year split into 2 groups and then half the group is split for 4 groups and there is 4 tutors in a table and you are doing some sort of practical thing and then also you are learning as you talking with them, so its more hands on but is also more like discuss. Yeah for RPD design videos one group goes up and explains the design and they get given like 30 minutes or an hour to do the design but like an ortho case with models , pictures and then just a work sheet what to do and treatment plan and different options, if they could explain that and have all together like.
I think Sheffield does one actually, I have been to their videos, the uni of Sheffield and they do like dentistry lectures.
future like the oral med ones are really really good. It is like lectures but she says a point and lets one line go so you can match the line with what she is saying, in the lectures the slides just got so many lines, do you know what, so she uses the picture and the line to go with it, another picture and another line to go with it, you know what I mean so that's a really good thing
Sometimes you know you have to watch those long videos, coz I remember like, I think it was oral med we had a salivary gland and that was like an hour and something, but we knew we had to watch it coz when we went in we were gonna be like tested on it.
I personally learnt quite a lot the way that sialogram lecture was done, Ive not actually had to go back and like look at it again because it has just stuck in my head, but that's just me coz I know everyone else is different.
I think also in seminars we had to do a bit of pre-work before it, which actually did help
I think You Tube is great, I use a lot of different universities that put videos up on there.
But even different universities have different approaches to things so quite a lot of videos around from Kings and like some of their techniques like erm Class II erm fillings erm quite a few tutors don't agree with it, so like Kings would use like the mimimal invasive technique whereas here they want you to clear all the margins, erm make sure you clear all the caries whereas at Kings they allow you to leave a little bit behind if that makes sense.
Oral surgery was good but she also did a handout with them and I think I appreciated a handout maybe more than the video.
I think for me because we have been doing oral surgery for a couple of years, they have only just recently put the videos on, we have kinda been sort of doing it

Theme 2 – Improved engagement with flipped-classroom teaching

One finding of this study is that the flipped classroom teaching improved engagement. It is widely acknowledged that there are three key dimensions of engagement. (127) The first is the cognitive dimension, where engagement may be

improved through students developing a deeper form of learning and are capable of self-regulation. The second is the affective dimension, where engagement may be improved via feelings of greater enthusiasm, feelings of interest or feelings of personal belonging. Lastly, the behavioural dimension is where engagement may be improved via increased efforts to participate and interact with others.

1. Cognitive improvements

Improved cognition from practising motor skills

Incorporating an element of kinaesthetic learning has been described as important when using videos for transmission of information. (128) Students expressed a great deal of satisfaction at being able to physically use some of the orthodontic instruments, and gave good examples of how it encouraged deeper learning, improved self-regulation and better retention of knowledge:

" watching the videos on their own was great but then actually practising it made it stick in my mind more. You learn more from that process because you are thinking about it more, you are thinking about using your hands, thinking about what you are trying to do, what you are trying to achieve "

" even though it makes sense when you read it, when you ask questions about it, it doesn't quite make sense to me, whereas if you have a session of doing it, you can actually link it in better "

" when we had the practical session and I felt that I learned more in that than I did like ortho seminars or the ortho week we had, just in terms of how much I retained from it "

For me I think the video worked best. I think it is just how I learn so seeing like an extended wire seeing someone cut it would stick more in my mind more than reading like if there is an extra bit of more cut so I think the videos work best for me
I think the video, especially with a summary, makes more sense because if you are going to deal with an ortho emergency I feel like you should know and have done something before rather than somebody just comes in and you are like I just had this lecture 4 years ago but you just remember that..
(when talking about watching videos then coming in to do practical) Suit me perfectly because its how I learn
I found it easier to sort of absorb
Whereas just sitting in a lecture I just doze off or I'll be on my phone, I like anything that's hands on to be honest.
I do find Im listening more by watching the video or whatever or doing it here rather than in a lecture.
It's a moving picture rather than a still, you can actually understand it better.
We just sat on our phones or asleep and you know its not good for anybody. The lecturer, it must be awkward for them because they know no one is listening, you can see it, it must be obvious and then we are all sat there kind of no paying attention, so no one is getting anything out of the situation.
I think dentistry is such a practical course and then to write on books in black and white without actually seeing a patient or getting a snapshot of that picture, you don't learn like what before and what after and whats in the middle of that and then just… You don't learn a lot
just found them a lot better than conventional lectures where I just get bored, doze off and then have to go home and try and figure out on my own
Yeah I like the flipped classroom with the practical element as well, erm because that is really important to my style of learning
(about lectures) So learning it and remembering it is kinda, you can learn something and then forget about it.
(You really liked it?) … I really thought it out, its definitely, I understand the lecture coz I'm a lot more hands on, rather than someone just talking at me.
It forces you to go to sleep as well!!! I really don't like lectures.
especially like for dentistry, stuff that I would learn on clinic from situations and hearing it from a tutor and then that will stick in my mind a lot more than lectures.
When we have used the end cutter and you are like oh it'll hold it in and start, I did it and it was wrong and it flipped out, so now I know. So now I wont forget how to use and end cutter, whereas if I'd got it right, I probably would have been like oh it was something like this.
You see I liked the practical bit coz then we just ended up asking questions at the time, so like for this case would it be this this and this and then we ended up getting taught it on a smaller scale and that was actually the best part of the week.
but I think like there is an element of being able to do like little bits of practical stuff does help to settle it in your head almost, I do like, as mentioned before, like if you do like root canal and stuff you do find like the stages sort of sit in your head a little bit better, so it is useful being able to watch the videos and see it
I really liked having the interactive full session you know the ones where we had like the distal end cutters and had actual wax being held in the hands, but I think that's much better than someone just sort of talking at you, because when someone is just talking at you it is like ok I can just zone out like for about 5 seconds and I just forget key bits of information.
I actually did stuff on clinics, I actually remembered it a lot more than someone telling me you know this is this and this is that, you see it and ok you remember that picture in your mind
It was good but wasn't efficient like now its like doing it with your hands is a lot more efficient way of learning.
I think in the lecture I cant focus, I like to sit and learn things myself, so I am really engaged when I am watching the videos and just understanding it and following it through and then when I come in I have got background knowledge and I can then just apply it and then probably learn more
(when) I have just made a mistake, then I can learn from that as well when its in the practical session.

I think that I probably like, when we had the practical session and I felt that I learned more in that than I did like ortho seminars or the ortho week we had, just in terms of how much I retained from it.
when we went back and did the practical, I realised there was things that I've had forgotten that we had had in the lecture because I'd zoned out, that was yeh the answer in the assessment, so it kinda became clearer having the practical side and the videos.
I had the videos at home and then the practical. And I liked that, its memorable compared to a lecture, you go away and forget about it, you don't remember it, but that video is memorable and I do remember it, I remember the content and remember what to do
and also in the seminar you can also introduce practical work in that seminar. What we did in the practical session that can be done in the seminar.
So far with orthodontics we have just gone through like a lecture series we haven't done anything practical. So even like putting brackets some of the common things that we do in practice, may be just get the feel things would be a good idea
It like helps you make sense of like what you are learning coz a lot of it like we are just learning theory and I feel like Im having to go home and make sense of everything that I have learnt I have not understood it in the lecture and I am trying to make sense of it. If I saw it or whatever like physically saw it, right ok that's what they are trying to show, coz the theory I cant understand it on its own by myself to make sense of it.
I think like you said, dentistry is a practical course and you have to have practicals and you have to physically see it, just me having braces I feel I have learnt so much about what things are and stuff..
More hands on treatment planning was better.
The hypersensitivity, I was in the conventional lecture, I don't remember taking in anything about the hypersensitivity.
and I definitely learn better if I can see something and listen to it.
Erm it was good that we actually got to see everything and then in the practical I actually got to like have a play around with it.
I agree with video learning it was useful but also in the practicals as well, so seeing the appliances themselves, so for me I didn't even know what I was here for so I learnt quite a bit on the day in the practical.
And also definitely seeing like having the instruments to have a look at, to see exactly what they look like so you can remember it is easier.
Yeh, cut a wire to size, put it on, just adding to what they said with looking at stuff, you are actually applying it as well, that's even better.
Yeah just similar, hands on stuff was good you know being able to see the sizes and feel the sizes of wires, in lectures just having group pictures of different sized wires doesn't really you know, how are you meant to know unless you actually feel it and see for yourself.
I learn better when I do it practically
so like crowns I kinda learn the best, if like somethings gone wrong when I have fitted a crown, I'll learn more from that than like reading
Well like I said before, it is very, like even watching videos for me sometimes I find difficult to get me to learn things. So erm watching the videos on their own was great but then actually practicing it made it stick in my mind more if that makes sense.
And because, I just feel you can't, you can't put it into context how difficult something is to do unless you do it, so it is easy to watch somebody who is a professional doing it and you think oh yeh that looks easy but then you try doing it yourself and it's like well that's not so easy, but you learn more from that process because you are thinking about it more, you are thinking about using your hands, thinking about what you are trying to do, what you are trying to achieve.
Yeh, I think it was, well for me it was more because like in the videos you were, well most of them, you were doing the stuff while you were talking, erm so like for me I wouldn't mind what length it was coz I was more kinda, I dunno, it was more interesting, whereas the online lectures it was literally the slide with one word and they are talking you just like, oh it's so boring.

2. Affective improvements

Improved confidence

Students felt that the flipped classroom learning created feelings of greater confidence after participating in the practical session:

" I feel like it has been a lot more helpful than any of the other ortho lectures we have had because I actually feel like I can answer questions now, whereas some of the other stuff I am still not that confident with, but I do feel like it has increased my confidence "

" you have got eight topics or something like that and this is only one of them. But I feel a lot more confident with this one probably than the rest "

I think sometimes with lectures, coz like they only put the main points on the lectures, if you haven't been to a lecture and you are just reading it, you think I have no idea what this mean but the videos put it into context
But I feel like it has been a lot more helpful in any of the other ortho lectures we have had because I actually feel like I can answer questions on sort of emergencies now, whereas some of the other stuff I am still not that confident with, but I do feel like it has increased my confidence.
Because you have got eight topics or something like that and this is only one of them. But I feel a lot more confident with this one probably than the rest.
if I can answer a question I feel a bit more confident.

Safety in numbers

Interestingly, closer to the time of assessment, students tended to shift from their preferred ways of learning in solitude, to peer-assisted learning:

" a couple of weeks outside the exam, just get together in little groups and talk through everyones different notes "

" I just do discussions and tie up any lose ends. Like it's the best way "

This change was not to acquire large volumes of new knowledge but instead was used as a way for students to assess their levels of knowledge relative to their peers and ultimately to comfort their fears. In other words, by knowing a comparable

amount about a certain subject, they felt safe that their level of understanding was adequate:

" and then if I know I have got an exam or something, then closer to the time I like to work in a group but generally I'm independent, so I wouldn't start working in a group until a week before a deadline "

Often students used this time when they came together as a group before an exam to ask questions of each other, forcing each other to explain their answers:

" So like nearer the exam or like once I'm happy that I have all the information I need in front of me and everything, then I am happy to just spend time with people and just go through questions "

" I like to ask questions with my friends, like we'll meet up and ask each other questions "

" Its better to have something I have missed out in the notes so I get the question wrong but if one of the others has got it right, it is better to talk through it that way "

So like nearer the exam or like once I'm happy that I have all the information I need in front of me and everything, then I am happy to just jut spend time with people and just got through questions, go through like just anything really. Lectures really
a couple of weeks outside the exam, just get together in little groups and talk through everyones different notes.
Its better to have something I have missed out in the notes so I get the question wrong but if one of the others has got it right, it is better to talk through it that way.
, I just do discussions and tie up any lose ends. Like it's the best way.
I like to ask questions with my friends, like we'll meet up and ask each other questions

3. Behavioural improvements

Improved interaction and participation

Participation in a form of social interaction is central to learning. A central concept of peer learning is that the contribution of others supports ones individual growth,

particularly if there are differences in competency levels between learners. One student, demonstrated this beautifully:

" we meet up and ask each other questions, so its quite useful when you are sort of explaining the answer to people, saying it out loud. That sort of helps me revise as well, so explaining the answer to someone who is asking me questions, that's quite useful for me. Then you learn off them as well, as well as helping them "

" you can discuss what you don't know or don't understand and ask groups of peers or tutors then other people will bring up their questions and you learn more "

Discussion among students was encouraged at appropriate points to support the social environment. Students felt the improved interaction and participation improved their retention of information:

" I think little study groups, listening to each other then explaining something, that helps it stick in my mind "

" I think interactive ones are good coz you are more likely to remember things by asking questions remember, so interactive is good "

For me the maximum is an hour or so and then I start fidgeting and look around the room and kinda drift off sometimes
Sometimes in lectures, peoples questions are actually quite good so maybe being in a group helps in that respect. Sometimes someone says something and you kind of thing oh yeah…
Smaller groups, and you have a discussion whereas in a lecture theatre you can't really have a discussion.
you can discuss what you don't know or don't understand and ask groups of peers or tutors then, you get answer and other people will bring up their questions and you learn more.
if you are struggling, if you don't understand something properly, its easy to have a proper discussion with you or maybe take a couple of minutes or so or longer than in a Lecture to answer questions so you fully understand it.
I prefer this where as a seminar kind of thing coz it is a more engaging environment I think
yeah I need to ask questions and its more interactive as well so I prefer that.
I like just kinda talking to other people about it like group study works for me coz if I am by myself I tend to get distracted.
(about lectures) don't like the way they talk, it's a bit like … actually be a little bit entertaining! they actually help me go to sleep quick but soothing, I'm like yes! You know what I mean, more like you know, like involve us more like stuff like that you know.
, it would be better in a short group, you could talk more.
we can stop and ask questions and its easier

testing each other, so like I'll work in a small group of people and will just randomly ask questions and I feel like if I get it wrong then I remember it more. *(getting it wrong is probably a positive thing?)* That really makes it stick with me.
and like with a group of people it helps as well to remember stuff.
We were in smaller groups so it was more interactive if you wanted to say anything.
Yeh you learn by your by mistakes, someone tells me oh like this is what you are supposed to do, you remember that for next time.
if you had any questions, you could come back in like in a little group and just say hey I don't understand this and would it be ok if you go over this
what is quite useful is because I live with other dentists, so we sort of revise independently during the day and at night we meet up, coz we live together, we meet up and ask each other questions, so it is quite useful when you are sort of explaining the answer to people so saying it out loud that sort of helps me revise as well so explaining the answer to someone who is asking questions but we are not testing them, that's quite useful for me. you learn off them as well, as well as helping them.
Depends for me like, if someone is really interactive and speaking really well, and you are wow I am actually interested, I would love it I really wouldn't mind, coz erm yeh but if it's like, obviously I am going to switch off
Sometimes I have done that or I'll just ask someone else who maybe understands it a bit more, to just give me an example
I usually ask the person next to me

Theme 3 – Awareness of Learning Needs

Identification of preferred learning style

Generally speaking, students were able to identify how they learn most effectively. On some occasions, they were able to demonstrate some insight as to why this was the case in their responses:

" I like the flipped classroom with the practical element as well, because that is really important to my style of learning and how I seem to remember stuff "

" I'm a visual learner, I just see something and it just stays in my brain, so like all these orthodontic appliances and stuff, the photos obviously help to remember them "

Students identified their learning styles using fairly basic terms. These terms were broadly in keeping with Howard Gardner's Theory of Multiple Intelligences model (129) and were: visual, kinaesthetic, auditory, verbal, logical, social and solitary.

I think I learn by writing my own notes. Erm just reading through them and writing them back out again, so it makes it stay in my mind and then erm I think little study groups listening to each others them explaining something that helps it stick in my mind.
I would just go through the lectures, I'll probably write out most of the lecture and then write out a crib sheet for each thing, just the main points I think are relevant and to make sure that I have learnt it, I use online flashcards.
I think writing things out with questions and answers helps me, there are lots of times I think I know something but if I rephrase it I am not quite sure!! That's how I think I learn.
Generally I just go through the stuff from lectures and then like print stuff and attach them and print it out and then I'll go through it all and highlight what the important bits might be and then once I have got like the complete notes and it is all highlighted I try and make mind maps
Erm, I kinda just learn like the main points that I thought were the main points
generally I make notes from lectures and then I print those notes out and go over them and then make a summary of those and I just keep throwing them away and making new ones
And then I like being tested by someone else so just give them my notes and then make them ask me questions about it and if I get it wrong then I know what to put
Yeh I just like to write things, so I have about 50 pages of the like the same notes, I just keep writing them out.
Erm like what I've got to do home learning I always struggle to know how much like how much detail you've got to go into and stuff, I like being told what to do a bit more.
The way I learn best is I do a bit of reading, so I know what to expect and er handout things are like, like if I understand why things are I learn better rather than just remembering this is what it is. I understand what is behind it rather than just remembering facts.
I think I learn best at kinasthetics, so you've got verbal and auditory and there are other types but for me it is best just to do it and not want to read instructions jut practice and so how I get on really.
I like a bit of reading before so I know kinda a little bit about something beforehand like a lecture and just making notes is the way I consolidate things.
I think for me probably watching and listening like animation or video. I think so, or just talking to a few people not necessarily a lecture coz its just completely something separate but just a little group.
So mine's probably a combination of, probably prefer to start watching a video, like crown preps and stuff like that, watch a video on You Tube or whatever and actually practically doing it, I just get bored reading all the objectives And as XXX said as well, just discussing in small groups as opposed to a large lecture theatre and stuff as in a smaller group you don't mind asking as many questions whereas in a large lecture theatre sometimes you are a bit hesitant to ask certain things, that's why you might just stay back or you might just think forget it.
I would also be like a visual learner, or audible.
Just someone speaking and answering questions might help.
I used to think I was more kinaesthetic but actually I think I'm probably not but that's only in the last year or so.
When it comes to understanding, there are 2 types of people, theres people who would just accept it and move on and there are some people that wont accept it and need to fully fully understand it before they go ahead and do it, I'm probably the latter, I need to understand it a bit better
But if you kinda learn something but the key points you write down and go back to revision that for me is a reminder of it
The way that I study is that, so I read something and I write notes on it and we do the lecture and I read my notes and then I summarise those notes.
Yeh summarising the notes and condensing it into one page.
That's pretty much what I do as well, although I have changed it now just because it doesn't seem to work at the moment, so I am making myself powerpoints with like pictures on because I am more visual I think and then I do the powerpoints and then I make questions on them and test myself on it. So that's what I am doing at the moment.
A bit of everything just to help me remember it.
Erm so I make notes from the lectures first just so I know I have got the information there but then I like just kinda talking to other people about it like group study works for me coz if I am

by myself I tend to get distracted.
So I'll read the lectures and then I tend to use books that have like, so like I'd use the orthodontic to read what is in the lecture, I just think it helps us understand it more and it has, like real life examples and questions like that you can, I think it helps like with the understanding in the bigger picture as well not just like isolated in that lecture topic.
I mainly just copy and paste the lectures from the online platforms, it is just a big document and just go through and highlight them a couple of weeks outside the exam, just get together in little groups and talk through everyones different notes.
So I make notes from the lectures but I highlight those and put in bits from the recommended text books
Erm so I feel like when I revise like when I learn things it is most efficient when I can actually have someone tell me, so sometimes I used to watch lectures online, I found that a lot more engaging and I would just listen to that and makes not from that and then I can remember things they said rather than just sort of reading from a text book, so that's how I kinda like how I like to revise generally.
I like to learn doing a bit of everything, so like moving about when I'm working I cant just sit in a lecture and learn really, reading things out to myself and the way I remember it is like visualising something I have read and then eh hearing it back in my head as well so it's a bit of everything really but traditionally sitting in lectures that really doesn't work for me.
The same, in lectures I'll write notes but I'll only take in probably about 30% of what's being said and I like reading and like listening to videos , having my own time to take in information and then I like speaking as well, like teaching other people, I think sometimes that reinforces it coz when someone asks you a question you have to think about you know more details to kinda to answer.
I'm a combination as well but I like doing colourful notes, like pictures, I like having something that I can make into, say oral medicine, having the picture and something that will trigger my memory of it and then once I feel like I have done really colourful notes as well so that I can remember seeing the name in different colours and things like that
Erm yeh I like to visualise things like with colour as well, making up like stories in my head with certain information. Erm also like asking myself questions, so like I'd write down like a question in my notes so that will trigger like remembering the information
Yeh I write myself questions and then just read the question and then try and think of the information
Erm I like to start with a big set of notes and the I will write a smaller set from that and I'll just keep going until I basically end up with like a set of flash cards, so I probably write the same stuff out like a bizzillion times but it's the only way I remember it.
Depends on what it is, so we had a set of oral med things that we had last year where we got lectures we needed to watch online before going into things where cases then discussed about patients, so you then got the practical application so it was quite good to do that at home first and then have a tutor there in front of you and talk about how you would apply those to patients. Erm If it is a lecture I need to learn, I need to write notes up that night, that then sticks in and similarly, Ive got sets of notes and then smaller sets of notes that will be spider diagram.
Its useful to be able to have them all so you can just go over them and look back but you definitely needed to go over them again, it wasn't just like a, you couldn't just maybe like sit through one lecture and feel like I'm confident with that, its all like relatively, it was a lot of stuff we just had to read over several times to me any way.
I'm a visual learner, I just see something and it just stays in my brain, so like all these orthodontic appliances and stuff, the photos obviously help to remember them
I like reading it and then like thinking about it kind of in the mind's eye like as a picture, like applying it to like what I do in real life
I like watching someone do something and then like clinically I like watching someone do it and then do it myself.
I like reading up first, I like reading it and making little brief notes like if I was revising for an exam, I'd like read it and then kinda I like need to get my head around it so sometimes I would write it
A mixture really, I can have it written down and read it, and that can be fine but usually it is always best to apply it to a situation, so I always think about how that would fit in, how would I use it, how would I do it? If I can do it, its easier to remember it if I have seen it, it is easier to remember it as well.

I am a bit of both, I find if I write it all down, I'll learn it, I'll make like spider diagrams and stuff of everything from like lecture notes and things like that, so it is not reading it from lecture notes and reading it from my notes and then I'll look at pictures and then I'll know what I've written and I'll keep reading and reading and reading it and then look at the pictures related to what I wrote, but yeh seeing it in real life helps too, but for exams and things that it what I do.
Mine is really similar to XXXX like write out all the notes from the lecture and then make a poster for each topic and then go back to it instead of having to go back through so many lectures, you just have to go straight to the post-it
Yeh I like listening to someone, I like that, I find it very hard to listen to just a video, like I like them being there.
and it's not a good idea that's what I'd do, I'd just write it and write it
I listen to what other people are saying and then I read.
I probably use, just like kinda, spider diagrams but like but like just use buzz words and things and keep it very short, erm quite a lot of colour if I can. I don't really like it when the lectures are huge loads of words and waffley, just simple, so just like buzz words getting the point across
Yeh I'm similar like, I'm the flash card girl, so I'll have like loads of words on a flash card and then I just read through my flash cards. Like condensing it down
Yeh we do get into groups sometimes
I get bored really easily like just by myself, I can't stick to just one way of erm revision like just writing, I cant do that, I have to either write and type or read, a bit of everything, I can't do one thing, so I don't have one set of something like somethings there somethings there, but I know where it is in my head, And, if someone asks me something, I know exactly what lecture it is in my head, I know where it is, I could tell you look her blah blah but yeh I need someone to like test me. Questions and like visual stuff more like someone's telling me you need to do this this and this, I cant process that as well as seeing it on a picture drawn out like you need to do this, lik
I think I'm a bit of a mix myself, I like the flash cards, if there is pictures of things, I will want to look at pictures, I'd much rather look at pictures, or videos rather than a whole book of text.
Questions as well, just to show that I know, because if I'm reading I think I know it but if I can answer a question I feel a bit more confident.
I need someone to teach me. I don't like sitting and reading through text books, if one of my friends has been through a topic I would rather they teach me and I'd rather listen than write it down. I print off a lecture and read it once and the go back and just highlight it
By listening to things or watching or looking at things. Like I could tell you like if I have got a lecture printed out, I can remember like where it is, like its on the top right corner on the second slide but I couldn't remember what's on the slide.
So I tend to summarise the lectures and then re-summarise again, but I do what XXX does and do flash cards and then so I just write up bullet points and this word link to that, then it also helps me ask other people questions coz I have to know it, I have to read what it is to think of the question, I like doing questions as well. Definitely questions, you can read it as many times as you want but it is only the questions that makes it for me that'll make it stick in my head.
I read through the lectures that are on Vital and like XXX I can remember vaguely where stuff is and what lecture it is, I also use the e lectures and listen to the commentary over that, that's quite useful as well. And also there is MCQ books out in the library and I found they are quite handy as well coz they do the questions and say why it's the answer and why
Probably I think when I have a lecture or something like that I can retain that information for longer than if I read it, so listening is probably the easiest thing, but in terms of actually sitting down to revise for an exam, it's just repetition of reading over and writing things out I think.
Erm, I think I am slightly different, I like to do things you know if I am trying to revise for something, I try to in my mind practice doing it, so err if I'm thinking about lets say its my extraction session tomorrow, I'll play it up in my mind as to what exactly steps are that I am doing, as opposed to just writing it out I think, I forget very quickly if I just write things out.
Ermm well I used to make really nice sort of notes and then I realised that that was like not really time efficient, so I know I just literally read and write and write and write in like a scrap

book over and over again, that seems to be better for me.
So I found with dentistry there is lots of photos in lectures and stuff so I type up my notes on a word document and then what'll do is erm go over it, read it first, this is what I am doing this time, go over it, read it first and then I'll shorten it into onto little revision cards and then I'll go over that and shorten it even more, so then I'm literally just looking at a word and everything pops into my head.
I think when I am learning something new, or try to understand something, I need a lot of context erm so I kinda just need examples and to really understand why we are using something for a certain situation so that I can link it in, otherwise if it was just like in a lecture in bullet points, and I have got no case or understanding why we are using stuff, I just won't retain the information coz I can't work out the answer, so I'm not good at just remembering things not having an example.
I am more like a visual learner, so photographs do help as well.
So I type up all my lecture notes like soon after we have had the lecture, but I also have to look at like text books and papers just sometimes to give the lectures like a bit more of a substance, just to help me understand it coz sometimes you'll just a lecture with just one word on it and like just one picture and it will tell you what it is but I feel like in order to understand it I need more information and a lot of the times I gather that information myself and then through the revision process, my notes will get even more condensed, when I'm just revising off something like mind maps. I think it is more like the interlinks between the different things coz I don't like lectures to be like completely separate like I can find like links between different lectures and pull them altogether within all the different specialities and feel like.. *(That's important to you?)* Yeh I feel like that helps me, helps me answer the questions and helps me understand it more and then also when you come into practice it isn't just going to be paeds or just ortho, you will have to treat the patient like taking into account like everything.
Erm I think I find lectures like really difficult to learn from, like when someone talks at me, I just can't concentrate, erm so I have kinda like gone through dental school just using text books and making notes from text books and when it comes to revision time, I will just like condense those notes further erm and that's worked quite well.
I like the lectures just coz like it's a set sort of what you need to know and then I just keep adding and adding things to it from books and sort of online and I find that like when I condense it down I am missing out sort of small points that are actually quite important and then I lose the context of what it was, whereas a lecture will tell you look this is what you need to know and then I'll will look around that topic of what the title was and it will give you like the basics, so I quite like the lectures in that respect.
Mine is just the odd time if I really don't understand something I'll you'll know ask someone else, look in a text book, go back to the lectures and stuff and then if I'm really stuck then I'll just tap it into You Tube and try and see some sort of video or practical element that might help me if I see it in a different way.

Previous experiences using learning style

Students were aware of how the methods they used to learn had evolved over time, reflecting on the changes between school, higher education and current preferences. Predictably, responses demonstrated that the increased amount of information being taught in higher education changed their approach to learning from being heavily reliant on being provided with all the information they were expected to learn, to supplementing their learning with practical experiences. This evolution results in improved retention:

" before university you had these books which summarised everything, so the information wasn't that much, whereas now it has come to dentistry like I would say that in terms of the volume like, I would struggle if I had to just read it over and over again, but then when I actually did stuff on clinics, I actually remembered it a lot more than someone telling me "

For the sort of visual and sort of doing it after, was probably about 3rd year, but in terms of group discussions I realised in my A levels I couldn't just sit on my own
and another thing is I cant sit in silence when I work so I need to have music on or watch tv or something like that otherwise I just don't get anything done.
Me I was going to say the same thing with learning in the upper sixth.
In my last degree it was more kinda taught on seminar based whereas in dentistry it was 3rd or 4th year that kinda developed better skills I guess.
but it is also really good that we get all the information on the slides that we can look at afterwards so its just sort of a good way of having the information there as we don't really have a text book or anything, so its nice to be given it so we can read it again in our own time.
Yeh when I was in A levels I relied on it loads so there was this account called Khan Academy and there videos are really nice and it was great for biology and chemistry and they were about 10-15 minutes and really like look at it its really pretty! It is really really good and the way they said it is really sort of, I really thought that was very useful.
I used it a lot when we did like PBL stuff and anatomy, there is one account that he draws a diagram and you print it out and then he talks you through, so it could be a flow chart, it could be like part of the anatomy and he just gives you options to annotate the diagram that he has already drawn for you and he finishes drawing it by the end of the lecture which I really good.
I think before university because like you know you had these CUP books which summarised everything, so the information wasn't that much, whereas now it has come to dentistry like I would say that in terms of the volume like, I would struggle if I had to just read it over and over again, but then when I actually did stuff on clinics, I actually remembered it a lot more than someone telling me you know this is this and this is that, you see it and ok you remember that picture in your mind.
In my last degree we would like read prior to going in the next day to our practical and then in our practical we would fill in a work book with questions in and every time we were there, we handed it in at the end of the year or for like each module and I feel like having that test the other day actually helped it was kinda like a similar situation where you kinda go away, learn it, you come in and have a little test, like that just helped but it made things make more sense.

Assessment style influencing learning style

Students were aware that their final degree examinations were in written format and were therefore keen to attend conventional lectures and print out the relevant lecture slides as this would contain all the information that they were expected to know for their exam. They appreciated that this was not the best way to learn for

them, yet were unwilling to deviate from this strategy because of prior experiences with exam success:

" the questions and even the pictures that were used in our exams, they are from our lectures, like there will be a tiny sentence, I don't know the answer, it will be like a tiny sentence at the bottom of like slide 30 and the answer is just there, like everything is in the lectures that's what we get tested on, so I think that's why we want a handout "

"Like when you are on clinic and you see something, you'll pick it up and you'll always remember it I think but when you are revising for exams, you are revising to pass the exam aren't you, you're not revising to increase your knowledge, it's to pass the exam. Nothing else, which is wrong really "

I think that either way what this has taught me is to look a things with a bit more rounded like you must pass the test like the reason why you are sitting these finals is to you know to give the best option to the patient rather than to just pass the exam, to look at it as that patient type of thing is a bit better I think.
I find it like, if you learn everything in theory without actually using it much or using it, learning for exams that fine but then you have just ticked a box, you pass your exams and you forget about it, whereas for example, when I started learning dentures, I had Mr Farrelly, he showed us how to do it and then we were learning the theory in half of the year groups and the he asked questions, at that stage I find learning it very difficult to just read books and understand because I don't really understand what a denture is, although when I get onto clinic and start doing it, then I realise certain things that he was talking about, so I didn't find it very helpful when I was reading books because I just don't understand, I just remember the fact that this is what it is.
I think you tailor it to each exam you at taking, like A levels it was a specification and I used to tick off each point, we don't get one ere so you've just got to tailor it to the exam kinda thing.
(what gives you the best exam results?) I think lectures do. Just because everything they ask us is in a lecture somewhere, it is on a slide like something buried deep, 2nd year perio or something! Its always there somewhere!
(Is there a point where we are not learning to pass an exam?) No not really. When you are on clinic…
Like when you are on clinic and you see something, you'll pick it up and you'll always remember it I think but when you are revising for exams, you are revising to pass the exam aren't you, you're not revising to increase your knowledge. Its to pass the exam. Nothing else, which is wrong really.
Well for me, it was when we started like preparing interviews for jobs, it makes you think like we are actually going to be in this situation in a few months' time so what would you do in that situation? So I think definitely from that point on, but before that it was definitely purely learning for an exam you didn't think of the real world or what's going to happen when you

get into it.
I think it depends what you are doing as well, if you are on clinic then, you are kinda learning, but if you are doing exam you are just doing it to pass the exam. If you are in clinic and you are doing a filling, you know how you'd do it, like you'd do it this way, but if, every filling is different, its not the same, whereas in the exam they ask us some stupid questions, like you do have to do it to pass the exam.
With the exams there is a few correct answers but what is the most appropriate. They are all appropriate but you try and do them all
And then if I know I have got an exam or something, then closer to the time I like to work in a group but generally I'm independent, so I would start working in a group until a week before a deadline.
I think the conventional would be more useful just cause that's what we are used to and exams aren't practical really, so you would read the lecture and you would answer a question and its all written anyway, so I think for exams it would be like that.
I think everything I have known for the exams I think I have just taken from the seminars that we had, coz like they had the handouts and stuff so I annotated them as the lecturer was talking to us and going for it and I just learnt from them. I didn't really use anything else.
For exams I write. (talking about how the student learn's best "for an exam')
I'll keep reading and reading and reading it and then look at the pictures related to what I wrote, but yeh seeing it in real life helps too, but for exams and things that it what I do.
You see in that assessment that you did for this, I think that if we had an assessment for every topic would help, and it would reinforce the learning because you had the practical session first, then the assessment and that highlighted, even though I had gone over the videos and notes and highlighted things that I'm not really sure I've answered that right, and then with the lecture after it and I was able to know, I learned more because I picked up on things oh right that's what I need to know, do you know what I mean? So reinforced my learning.
, its just so you can go on it and its like a quiz and at the end it tells you your answers and then you would know sort of how your revision is going and what you need to improve on, so you know which..
I think it is a check list for me because you know like everything you will be tested on, most of it will be in the lectures. So it's kinda like after you have done all your other revision, that you you sort of have a quick read through the lectures just to make sure you've not missed anything.
if you just want to like memorise it for exams, then yeh they are great because they have got everything you need to know and that's where all the questions come from.
we have put up with 2 years of lecture and we have passed our exams with them, so as bad as they've been, weve passed the exams with them, whereas the videos are a new concept that you are trying so its like its almost untested.
Even like the questions and even the pictures that were used in our exams, they are from our lectures, like there will be a tiny sentence, I don't know the answer, it will be like a tiny sentence at the bottom of like slide 30 and the answer is just there, like everything is in the lectures that's what we get tested on, so I think that's why we want a handout, we want a lecture yeh!

Teacher accessibility

A potential problem with flipped classroom teaching is that the teacher is not present during the initial knowledge acquisition phase. This restricts opportunity for further explanation, clarification, or for questions to be answered immediately. Some

students went as far as suggesting that the presence of a teacher is almost compulsory:

" the person is there to answer questions and to kinda give us some expert advice "

For some, the absence of a teacher was an issue, particularly in relation to having questions answered:

"Just you can't ask questions at the time but you can kinda save them and ask them when you have like a tutorial… it's just that risk of potentially forgetting to ask and you leave and it's a missed opportunity "

" You don't have a chance to ask a question do you if you are watching a video at home. By someone who knows the answer for sure "

Others actually found that not having their questions answered immediately, actually heightened their desire to seek answers to their questions:

" (Would you feel that your desire to ask the question might diminish between the time of watching the video and coming in?) I think it would probably get more for me… it would wind me up if I didn't know "

Regardless of how students felt about whether the presence of a teacher was crucial or not, there was widespread agreement that the smaller class size in the flipped teaching improved teacher/student interaction:

" because there was fewer people, any concerns that we had were addressed straightaway "

The lectures you get that and you get it pointed out where the speckled area is or whether this is or that is, whereas if its just a video and you cant see something, you cant really ask the video.
Specialist lead isn't it, the person is there to answer questions and to kinda give us some expert advice
And the fact if you do have questions you can ask there and then.
if there is a question and answer kinda forum or something like that, then people can ask questions and you can see what other people are thinking and then our supervising tutor can log on to that and say this is what it is or
It's a fair point, if there's not a tutor there to ask questions, you are probably less likely to ask unless there was like another session after the video where you could like feed back questions or something, I don't know or an email or something.

Sometimes tutors can like say a little nugget of information that's not actually on the slide
I also feel like the head of like ortho, I email them with questions but nobody replies, then I forget about the question and I don't know the answer so we need more like, we don't get that much experience so they should at least respond to the questions, you know what I am saying?
Just you can't ask questions at the time but you can kinda save them and ask them when you have like a tutorial.
Its just that risk of potentially forgetting to ask and you leave and it a missed opportunity potentially.
because there was so fewer people, any concerns that we had were addressed straightaway
I think you need someone there to explain it and be able to ask questions if you don't understand something cause otherwise you could end up bombarding them with emails if you were doing it at home.
I like yeah the opportunity to ask questions is good as well.
(Would you feel that you might have a question when you have watched the video but then your sort of desire to ask the question might diminish between the time of watching the video and coming in?) I think it would probably get more for me. Yeh Yeh, you'd wind me up if I didn't know!
You don't have a chance to ask a question do you if you are watching a video at home. By someone who knows the answer for sure.
If you could do like a comments on the video and someone like yourself could come back with answers to questions If there is a question that I might have thought of and there's already an answer then its happy days init
its important to be able to ask questions as well, I think.
you might not be able to ask questions, if you to rely on a reliable contact for that, now what was the third thing?
Even asking questions like if you are unsure about anything, even if you don't want to say it during the lecture, but after you can go up and ask questions and at the end obviously people ask questions as well.
I think it's the confidence that they will get back to you, I don't mind emailing but you know waiting 2-3 weeks for a response!

Relevance of material

Students were of the opinion that flipped teaching was good for learning about practical skills because they could see in three dimensions what the skill involved and the sequence of events required for success. However, they also noted that for learning purely academic content, such as facts or theory, they would prefer conventional lectures:

" The lecture was good for giving like the basis of the learning so you had gone through it and if you had listened to it then the fundamentals were there, then when you got to watch the videos then you could apply that to the practical learning "

" I think if they are just facts that you have to learn I'd prefer just to learn it. If its like skill, then a video "

emergencies is like a physical thing that you are going to do so it works to watch videos
well I think it depends what you are doing like the emergency things makes sense but then if somebody was just talking to me about Class II Div I, I don't know if it would be as good for it
The lecture was good for giving like the basis of the learning so you had gone through it and if you had listened to it then the fundamentals were there, then when you got to watch the videos then you could apply that to the practical learning, so you have got your notes, you know the principle with having the videos you can see how it is done and so you can put your theory into practice
I probably wouldn't watch if for everything
For something like oral med, I think I'd probably just prefer the lectures, and replace the things that are sort of more practical I'd prefer this method.
I think if they are just facts that you have to learn I'd prefer just to learn it if its like skill, then a video.
But the practical side of it, then videos and doing practicals is better, but for the theory I would prefer a lecture.

Theme 4 – Proposed teaching / curriculum changes

Catering for a combination of learning styles

After reflecting on their own individual learning needs, many students offered their opinion on how the teaching methods or curriculum should be changed to enrich their learning. When asked if they felt that flipped classroom teaching could replace conventional lectures, students suggested that a combination of conventional lectures and flipped classroom teaching would be best. This was mainly because the flipped teaching brought a practical element to their learning and printed lecture handouts provided a familiar way of revising for assessments:

" I think I have learned a lot from the practical but then a video would just be for me to go back to as well, in terms of revision. I could look at my handout and then write down anything extra from the videos "

" I like the combination, maybe if we didn't have a lecture we just had videos to learn from then I would worry about that but if we had ortho videos and then the lectures after that then that would be good "

I personally thought I don't think one or the other was not better, I felt they were better together, like if you had both to be honest, just because, I know the video like you just watch it quickly, but then sometimes I feel like if you have a lecture you can just read through it and then its just .. I don't know I wouldn't go back and watch the video every single time if I wanted to.
the videos are really good but then maybe just like something to be like ok this is also the main point
I think they work better together to be honest. But I don't think you necessarily need to like have the lecture where somebody needs to explain it to you because if you have got the video then they are explaining it to you, do you get what I mean?
I wouldn't say I'm indifferent, I would say I want both.
If I only had the choice one, I'd have that but if I could have both I'd rather have both.
I think I preferred like the video a little bit more just because I felt like it a little bit more detail compared to the other lecture. I think I would prefer it if we had a video but then like had a handout just to kinda go with it so we could just refer back to, just something we could print out but yeh I think both of them together would be good.
I think the video is good in terms of memorising because its easily memorable, like a lecture is more easily engaged with a video so in that sense it good but I do think both together would be better.
I like the flip learning but I feel like I wanted a bit more knowledge before so even if I just had slides I could flick through slides didn't have to be an actual lecture, just high volume information to trawl through pictures and get a better idea
Even if it was just a lecture and it is quite quick and you could have them and then watch the videos.
I think like the videos but again I feel like maybe a summary or a crib sheet or just something to go with it and again if it was that combination that I preferred that to a lecture but just something written down and I feel like it is a comfort blanket just like to have a summary or notes or something that's just like that rather than something that you are just watching, again a combination.
I agree with what's been said, probably prefer videos but something else to go with it at the same time.
again having a hand out like so as I watch the videos like annotate it.
I prefer the video but with like a handout or just something you can go off a well like make your own time and stuff.
Yes, so it works but yeh I agree that the video and a handout would be perfect.
I think it would be good if we had actual videos of the lecture as well, that would help.
Yes sometimes when you read something it doesn't make sense or you don't understand what the natural concept is and you like seeing it sometimes in action.
The good thing with lectures and the flip is good for everyone whereas if you just stick to one method then some ones always not going to be happy, whereas if you have got both then you are satisfying both style of learners.
I like the flipped classroom learning, you can watch the videos and kinda learn something and then you can apply that with the seminar session
I was thinking just for learning purposes like if we kinda had videos and a deadline and then kinda say this is how we all talk in a groups so whatever we can discuss about pressure and stuff like that and also to make it more complete, so I like to make notes myself like that so powerpoint for example so I can jot down notes
There was nothing wrong with the content from what I remember, it was just boring.
I like the idea of having like a lecture print out with videos as well as the idea of maybe watching it beforehand and then having the lecture like to sort of assist you as well
In an ideal world probably I'd like both the lectures and the videos

the lecture complete with a video would be really good like even if they could do split screen on the lecture board where they go through information and the video assists it. I like the practical side of it as well. It helps me learn a lot too.
I do think the videos are really good but I am just a little bit concerned that er I would have to write out my own notes from videos, I would like a bunch of slides too, so I can have written materials to for revision.
I like the idea of having both like but I don't know if that's just greedy!
Yeh I feel like having handouts, I know we have gone to some lectures where they will put the handout of the lecture on like a week after we have done it, and then all your notes are scribbled down from the lecture and then you forget sort of whats what and then you are trying to write your notes onto the handout that you have printed and it is just everywhere the information is just sort of, you don't really understand what you are reading coz I just scribble down stuff if there is no handout and that has happened a few times, it would be nice to have them already there before we go into the lectures, so
I would say that I like the combination, like XXX was saying before, maybe we didn't have a lecture we just had videos to learn from then I would worry about that but if we had ortho videos and then the lectures after that then that would be good
Um I feel like both having both the lecture and the videos is good
I think like yeh having videos would be really good and then seminars. video, seminars and then if there is time lectures as well like why not?!
For me, I don't need the lectures, but definitely the videos and then a seminar to kinda just go over things that we didn't get from the videos
I think it is really important to have a mixture of both because they both have like you said positive and negatives and if you just have the conventional lecture, you will be boring and won't see the practical and if you just have videos, I wouldn't feel like I have been taught anything , I'm coming to uni, I could just sit at home.
But yeh again handouts would be useful as well as the lecture, something e can print out for revision to make flash cards if people wanted as well.
But a handout as well I think it a good balance.
my favourite thing is a video and handout. I think that would be really good.
Yeh! I think personally I wouldn't really benefit from a handout I don't really use them but I think having the recordings to go back to
Or even have it like have the video but also have like the lectures as a PDF as well so you can like download it and annotate is whilst you are watching it too.
And also if you've got a reading list at the end, you can go back and like some people that like to condense their notes, I tend to find I write more than less, so its good to have a reading list to refer back to, to get more out of it if that makes sense?
I think the way that it was done this time, I'd preferred the practicals and the videos, but I think if it was sort of all the appliances and everything behind it, I would prefer a lecture personally.
Yeh if I had to chose, my first port of call was the handout and then I went to that to read it to understand what was happening and then I just watched the video just to see ok that makes sense but I can't say I sat down and watched every video religiously.
Yeh as long as I get a handout!!! (Laughter) Yeah because then I can write down anything extra that I personally learnt from the practical session that I think I want to.
Coz I think I have learned a lot from the practical but then the video would just be for me to go back to as well, in terms of revision, I could look at my handout and then write down anything extra from the videos if there is nothing I understood from the writing.
Yeh I think it is good I have used the handout and then used the video to supplement the handout, the other way round. That's what I'd do.
As a check list like I said at the very end erm once I understand from videos just going back through it and making sure I have covered everything in my mind that I need to cover, because like there might be some, I don't know, some erm, something on data for instance like 1 in 10 children…… which may not be on video, which you can't really explain on a video but would be on the handout which could be an exam question.
So things like stats for instance that you probably wouldn't cover in the video, but it would be in the handout. If that makes sense.

Changing structure of learning material

On many occasions students listed the things they didn't like about conventional lectures and how the flipped teaching offered improvements. In terms of their preferences relating to how the curriculum or teaching was structured, they preferred organisation of new material into distinct categories of a manageable size, include breaks between lectures and reduce the length of conventional lectures in general:

" because it was all split into like a topic at a time, you weren't like bombarded with information "

" I like it when lectures like sort of have a step by step picture guides, I always find that useful "

There was also the consensus that smaller, more interactive groups could be used in conjunction with lectures:

" I don't mind then but you know like the ones we have got are way too long and they we have got so many of them back to back and it like I think maybe we should get a lecture and then a seminar after that to like consolidate it rather than have a load of lectures "

the seminars were really good because they broke it, everything down into sort of like, in terms of like ortho they broke it down
I think some people struggled with the lectures because you had to have sort of like a long attention span for a brand new topic obviously
I think I like lectures more as like a revision to go over then, at the time when I am learning brand new I don't really like lectures but if its like say we had a revision lecture the other day on a completely different subject, it kinda helps consolidate it a little it, so maybe do the video to help people learn it and then do like a little revision lecture to like..
I don't mind then but you know like the ones we have got are way too long and they we have got so many of them back to back and it like I think maybe we should get a lecture and then a seminar after that to like consolidate it rather than have a load of lectures in 3rd year
it was like full days of like say 7-8 lectures
if they had a voice recording or something that we could reference back to
But I just don't like how they are *Back to back , even if they just broke them up a little bit*
it was just back to back to back and it just gets so physically and mentally just draining
You can look at the questions before hand and like it wasn't back to back so you had quite a

bit of break between seminars like a few weeks or something so it allowed you to go through.
it is literally like 9 til 1 and then like 2-5, (no breaks) just toilet stops, you know not like a proper break and I think the attentions span is about 40 minutes or something isn't it?
If you have got like a couple of lectures straight after each other, if you are just listening to someone talk for 3 hours You stop listening!!
It was just back to back..
If felt a bit of a slower pace coz in the lecture it was quite quick and then like next slide, next slide, next slide
It was too much information to take in as well, you just do get a bit overwhelmed by it. With the seminars they break it down for you and you can ask questions a little bit easier as well.
because it was all split into like a topic at a time, you weren't like bombarded with information
Just broken up a bit, it was the volumes in a short space of time on a brand new topic and something that was so different from what we had done. I think just over a couple of weeks, so if there had been a couple the week before even, something as simple as that would have made a big difference.
That's exactly what I thought, just time to digest the information between each lecture.
having it broken down into like little sessions, it makes me focus a bit more as well coz you cant get away with just sat there on your phone or whatever so, not that I do that! honestly.
I feel like when we have like a block of 5 after each other, you lose the plot after about 3 maybe even 2 and I am just gone! And I don't concentrate.
I think in particular with the ortho ones they had one that was like 200 and something slides and every time I open it it like makes me feel a bit sick!
It is something to do with the concept of the ortho, it can be explained in a much simpler way but it is overly complicated when I read them
And it just confuses everyone, whereas I think it can be narrowed down a bit, it can be explained in a really simple concept
I feel like some of the seminars and the lecture overlapped anyway, so you would kinda repeating yourself
I think there is an element of what you said that is true like you need some background knowledge if we are going into a seminar, like I think there has to be something, like so you're not just going in blank to a seminar
I was just wondering, you know like the cephalometric metric measurements and all this, it might sound a bit harsh, but I feel like when I graduate I'm going to forget a lot of these things, like you are doing it for the purpose of doing an exam, it's like if you ask me I would remember how to do Pythagoras's theory, I'm not really sure when I would apply Pythagoras theory to my everyday life, I think there is like definitely like a need to understand the basics but not over-emphasise the things that as you know a GDP you won't really be using, in a lot more, like instead of being like this is a twin block, this Class I you use Class II Div I, so that's ok yeh cool this is a twin block, this is when you need to use it, these are the examples of what situations do it, get examined on those specific things, then like
I think as well the length of the lecture, you can be really enthusiastic in the first 15 minutes and then it just loses itself like split up into topics having like a 5 minute breaks and then continuing.
Erm long, very long, from usually from what I remember they happened on a Friday afternoon
Yes, so they'd split it in half, 75 and 75, you'd be in that lecture theatre for 3 hours, it's like loads of information and after the first hour or so, people just switch off and then we had the, at Christmas we had the ortho, what was it, the teaching where we treatment plan but we also got more lectures again, but it was the same again the lectures were pretty long
in terms of lectures at the moment, they are bit of a shambles, some slides might explain what an appliance is, but then wouldn't explain what the next one is
, I have never really examined a patient with braces on or any ortho appliance, so actually I'm just about it in my head right now, do you know 2nd floor paediatrics, half of its paeds and half ortho, we just see on the other side you guys, we never actually go there, so if there was a clinic like oral diag where we see a patient and we take a history so you have loads of ortho patients that are on review or you need to just tighten it or something, if we just take a little history and present to staff, after 10,15,20 mins and then the rest of it we can just watch

you do, or even if we did that and watched what was doing so far and we don't get much photography experience either, its only restorative we take a lot of pics, but I know in ortho you take pics at every stage, so even if we got to take pictures, with the settings that are recommended by the tutor or something, that could be a good sort of component of the ortho bit, I'm not saying let's do it often, once or twice a year, like once every term or something, but that way we can sort of get more experience in other aspects of ortho and get some experience of taking photographs.
But from my experience, the videos from other lectures on Vital, the best way to structure it is when they have titles of the different slides on the side, then you can click through you know exactly ok that's what this is going to speak about, so it's just not one one hour long where you don't know where everything is.
Even like if we are talking specifically about ortho, like breaking it down a bit more, especially when we are doing something like for the first time
2 hours and someone was just standing there talking to us about ortho, bearing in mind this was like the first time we had done it.
And there is appliances coming left right and centre, it wasn't structured like, I feel like if we had the 4th year seminars first where they broke down from like the Class system and then had the 3rd year, it would make a lot more sense, like the 4th year seminars were really structured and told us like if it's a Class II DIv I this is whys its caused and this is how you treat it, like that instead of just throwing loads of appliances and be like this is for this and this is for this this is for this. I don't know what a Class III is right now.
I think maybe like an introductory lecture first would useful, just to break everyone in and then build it onto seminars.
Yeh because I feel like in order for me to make links, I need to understand the basics first. So in 3rd year I didn't understand the basics at all in ortho and when I got into 4th year and then we started doing the seminars, I was able to understand it more. and then like I was able to make like links between the different things or see a picture of an appliance and oh like I know what that's for, I know what Class it is and what can cause that Class like and stuff like just because we have these seminars and it wasn't like literally just like 2 hours listening to someone talk about different appliances that you have no idea about.
It's just mainly I think with the videos or with the teaching being outside of the dental school, it does gives, there is a bit of variation between students, it doesn't give everybody a baseline and I think from what has come out of this week, is that we didn't have a baseline from the lectures that's why we all struggled so it is making sure that there is something to be able to get that.

Changing sequence of learning material

When considering the order in which the material was being taught, students suggested that lectures should ideally build on simple concepts before explaining more complex ideas and include more revision lectures:

" still trying to work out like the steps, you are still trying to figure out the little things before you can see the overall picture really "

" if they swapped it would be so much better if we like had the smaller teaching first and the just a revision recap lecture the year after "

" some sort of like storyline would be good not just..like a journey, not just this is this topic this is that topic "

the seminars were really good because they broke it, everything down into sort of like, in terms of like ortho they broke it down
I think some people struggled with the lectures because you had to have sort of like a long attention span for a brand new topic obviously
I think I like lectures more as like a revision to go over then, at the time when I am learning brand new I don't really like lectures but if its like say we had a revision lecture the other day on a completely different subject, it kinda helps consolidate it a little it, so maybe do the video to help people learn it and then do like a little revision lecture to like..
I don't mind then but you know like the ones we have got are way too long and they we have got so many of them back to back and it like I think maybe we should get a lecture and then a seminar after that to like consolidate it rather than have a load of lectures in 3rd year
it was like full days of like say 7-8 lectures
if they had a voice recording or something that we could reference back to
But I just don't like how they are *Back to back , even if they just broke them up a little bit*
it was just back to back to back and it just gets so physically and mentally just draining
You can look at the questions before hand and like it wasn't back to back so you had quite a bit of break between seminars like a few weeks or something so it allowed you to go through.
it is literally like 9 til 1 and then like 2-5, (no breaks) just toilet stops, you know not like a proper break and I think the attentions span is about 40 minutes or something isn't it?
If you have got like a couple of lectures straight after each other, if you are just listening to someone talk for 3 hours You stop listening!!
It was just back to back..
If felt a bit of a slower pace coz in the lecture it was quite quick and then like next slide, next slide, next slide
It was too much information to take in as well, you just do get a bit overwhelmed by it. With the seminars they break it down for you and you can ask questions a little bit easier as well.
because it was all split into like a topic at a time, you weren't like bombarded with information
Just broken up a bit, it was the volumes in a short space of time on a brand new topic and something that was so different from what we had done. I think just over a couple of weeks, so if there had been a couple the week before even, something as simple as that would have made a big difference.
That's exactly what I thought, just time to digest the information between each lecture.
having it broken down into like little sessions, it makes me focus a bit more as well coz you cant get away with just sat there on your phone or whatever so, not that I do that! honestly.
I feel like when we have like a block of 5 after each other, you lose the plot after about 3 maybe even 2 and I am just gone! And I don't concentrate.
I think in particular with the ortho ones they had one that was like 200 and something slides and every time I open it it like makes me feel a bit sick!
It is something to do with the concept of the ortho, it can be explained in a much simpler way but it is overly complicated when I read them
And it just confuses everyone, whereas I think it can be narrowed down a bit, it can be explained in a really simple concept
I feel like some of the seminars and the lecture overlapped anyway, so you would kinda repeating yourself
I think there is an element of what you said that is true like you need some background knowledge if we are going into a seminar, like I think there has to be something, like so you're not just going in blank to a seminar
I was just wondering, you know like the cephalometric metric measurements and all this, it might sound a bit harsh, but I feel like when I graduate I'm going to forget a lot of these things, like you are doing it for the purpose of doing an exam, it's like if you ask me I would remember how to do Pythagoras's theory, I'm not really sure when I would apply Pythagoras

theory to my everyday life, I think there is like definitely like a need to understand the basics but not over-emphasise the things that as you know a GDP you won't really be using, in a lot more, like instead of being like this is a twin block, this Class I you use Class II Div I, so that's ok yeh cool this is a twin block, this is when you need to use it, these are the examples of what situations do it, get examined on those specific things, then like
I think as well the length of the lecture, you can be really enthusiastic in the first 15 minutes and then it just loses itself like split up into topics having like a 5 minute breaks and then continuing.
Erm long, very long, from usually from what I remember they happened on a Friday afternoon
Yes, so they'd split it in half, 75 and 75, you'd be in that lecture theatre for 3 hours, it's like loads of information and after the first hour or so, people just switch off and then we had the, at Christmas we had the ortho, what was it, the teaching where we treatment plan but we also got more lectures again, but it was the same again the lectures were pretty long
in terms of lectures at the moment, they are bit of a shambles, some slides might explain what an appliance is, but then wouldn't explain what the next one is
, I have never really examined a patient with braces on or any ortho appliance, so actually I'm just about it in my head right now, do you know 2nd floor paediatrics, half of its paeds and half ortho, we just see on the other side you guys, we never actually go there, so if there was a clinic like oral diag where we see a patient and we take a history so you have loads of ortho patients that are on review or you need to just tighten it or something, if we just take a little history and present to staff, after 10,15,20 mins and then the rest of it we can just watch you do, or even if we did that and watched what was doing so far and we don't get much photography experience either, its only restorative we take a lot of pics, but I know in ortho you take pics at every stage, so even if we got to take pictures, with the settings that are recommended by the tutor or something, that could be a good sort of component of the ortho bit, I'm not saying let's do it often, once or twice a year, like once every term or something, but that way we can sort of get more experience in other aspects of ortho and get some experience of taking photographs.
But from my experience, the videos from other lectures on Vital, the best way to structure it is when they have titles of the different slides on the side, then you can click through you know exactly ok that's what this is going to speak about, so it's just not one one hour long where you don't know where everything is.
Even like if we are talking specifically about ortho, like breaking it down a bit more, especially when we are doing something like for the first time
2 hours and someone was just standing there talking to us about ortho, bearing in mind this was like the first time we had done it.
And there is appliances coming left right and centre, it wasn't structured like, I feel like if we had the 4th year seminars first where they broke down from like the Class system and then had the 3rd year, it would make a lot more sense, like the 4th year seminars were really structured and told us like if it's a Class II DIv I this is whys its caused and this is how you treat it, like that instead of just throwing loads of appliances and be like this is for this and this is for this this is for this. I don't know what a Class III is right now.
I think maybe like an introductory lecture first would useful, just to break everyone in and then build it onto seminars.
Yeh because I feel like in order for me to make links, I need to understand the basics first. So in 3rd year I didn't understand the basics at all in ortho and when I got into 4th year and then we started doing the seminars, I was able to understand it more. and then like I was able to make like links between the different things or see a picture of an appliance and oh like I know what that's for, I know what Class it is and what can cause that Class like and stuff like just because we have these seminars and it wasn't like literally just like 2 hours listening to someone talk about different appliances that you have no idea about.
It's just mainly I think with the videos or with the teaching being outside of the dental school, it does gives, there is a bit of variation between students, it doesn't give everybody a baseline and I think from what has come out of this week, is that we didn't have a baseline from the lectures that's why we all struggled so it is making sure that there is something to be able to get that.

Changes related to the teacher

An enthusiastic, engaging presentation style was described as crucial in the success of the conventional lectures in terms of attention span and retention of information:

" I think you can tell if the speaker wants to be there or not, so sometimes you have a lecture like you said and they are just so engaging and then you want to listen and you can't not listen type of thing, but other times you would just switch off "

" Even though you don't know them though, if their tone of voice or you know they are just mumbling or they are in corner, you are not going to listen "

I think you can tell if the speaker wants to be there or not, so sometimes you have a lecture like you said and they are just so engaging and then you want to listen and you can't not listen type of thing, but other times you would just switch off
Even though you don't know them though, if their tone of voice or you know they are just mumbling or they are in corner, you are not going to listen, but if they out and they are speaking they are going to be more engaged.
How well they explain things as well because I found like that in the 3rd year ortho lectures, they expected we knew more that we actually did, so they would say this is this component and we are like what is that actually and they try to explain whose and we were like we don't really know
Quick revision lectures they are because we do have room for quicker revision lectures but maybe not 150 slides.
So from my experience, I think that with lectures a lot of it for me depends on the actual speaker and whether they have got that charisma where they can engage the crowd, you know you get a lot of lecturers, we all experience it when we are sitting in a lecture, I don't want to mention any names but you are sitting there and you are literally nodding off, or fighting to keep your eyes open, but there are some lecturers who actually engage you ask you questions and that keeps you awake and keeps you in the process but

Changing sequence of learning material

When considering the order in which the material was being taught, students suggested that lectures should ideally build on simple concepts before explaining more complex ideas and include more revision lectures:

" still trying to work out like the steps, you are still trying to figure out the little things before you can see the overall picture really "

" if they swapped it would be so much better if we like had the smaller teaching first and the just a revision recap lecture the year after "

" some sort of like storyline would be good not just.. like a journey, not just this is this topic this is that topic "

I don't mind then but you know like the ones we have got are way too long and they we have got so many of them back to back and it like I think maybe we should get a lecture and then a seminar after that to like consolidate it rather than have a load of lectures in 3rd year and then 4th year just get seminars, I think they like they need to be kinda together, coz I don't really learn much from like the lectures and then the seminars are like oh ok that's what they were on about it kind of and it started to make sense.
I don't see the point in having the lectures if we are going to have seminars every week in 4th year, I found I learnt to much more in the seminars than I did in the lectures.
It didn't make sense from what I can remember until about 4th year when everything started to kinda slot into place, coz it was done a bit slower in 4th year coz it was seminars
I think erm maybe have a refresher day, like we had one in 4th year I think, and there was like, everyone was there and we had like 5 cases or something in groups and we all talked through them and stuff. Yeh I thought that was quite useful, so maybe just one day in 5th year like that, coz I feel like we do a lot in 3rd and 4th year and then not really so much in 5th year. So yeh
Yeh like even just like the seminars, start the seminars in 3rd year , just don't have that week of lectures and then start the seminars then, if that's appropriate
I thought that after the 3rd year lectures, I was basically like I just don't know anything to do with ortho, it was only when we had the seminars that I actually understood what they wanted, so I just thought 3rd year wasn't, like it didn't have any meaning.
Its because there were so many new terms no one knew, I just remember like new words, no one knew what they meant.
I like it when lectures like sort of have a step by step picture guides I always find that useful, so it like before someone's showing you like to hold the instrument or whatever or like how to cement back on something or other, because it is showing in you stages, that's always useful because then you can go back over it if the lectures get put up onto like Vital, but that is always helpful
In terms of what I would change, if it was me I don't think I would have any of the lectures in 3rd year just from my experience I would benefit if you are going to have the seminars in 4th year I don't think there is really any need for the lectures because you can go in as a fresh slate and it starts from the beginning anyway. With treatment planning and ceph and everything so I just think it would be better to do it that way.
still trying to workout like the steps, you are still trying to figure out the little things before you can see the overall picture really.
you were learning it more in the seminars than you did when you a lecture back in 3rd year, so they were the same thing, like impacted canines or something, and it was exactly the same a the lecture.
Could we have the orthodontic emergencies like in 3rd year, why does it have to wait til 5th year?
But then the 4th year seminars that we had coz they revisited the stuff I found that I learnt it

much better in 4th year cause it was the same sort of If they swapped it would be so much better if we like had the smaller teaching first and the just a revision recap lecture the year after,
In the 3rd year we had like something similar so we did have a day where we like broke off and did treatment plans but nobody knew how to do treatment plans because all they'd give us was those lectures where they just assumed that you knew it, like none of us knew what a transpalatal arch was, so having it swapped around so like someone teaching first and then having the design thing big lectures kind of thing.
But also, with regards to the course itself, I think, no offense to anybody, the way it is, the order is a mess and I think I did learn like XXX said everything in 4th year so just ordering it and just making sure we understand the basics before we can like treatment plan, just know what the principles are, like really make sure we really know before we can do like a treatment plan, I don't know what was going on here back in 3rd year, so that's really important
Especially with ortho like, its complicated as it is, we start looking on the internet and that just opens a massive tin of worms because there's all kinds on there so you do need to have a good foundation before we can start doing on our own research.
I think sometimes because ortho is not something you do as a GDP but people who are lecturing kind of forget that we are going to be GDPs at the baseline so they are moving on 10 steps ahead and we haven't even started, so it's sometimes remembering that we are at like baseline and we need to know what Class III even is. Before we need to know, what the different appliances are.
We talked about, you mentioned about how do they follow on from each other, they didn't really, they just were just kinda ok this is how you deal with an ectopic canine, this is Class II Div I, this is Class III
Yeh some sort of like storyline would be good not just.. Like a journey, not just this is this topic this is that topic

Changing physical learning environment

For some students, changing the learning environment can result in improved engagement:

" sometimes in a lecture I just sit there and just wait for the talking to stop but I don't actually learn there "

Students also reported that downsizing the physical space in which the lecture is given may improve the chances of them stepping out of their comfort zone to ask questions. This was expressed as something difficult to do, potentially resulting in a lost opportunity to ask the teacher a question:

" in a large lecture theatre sometimes you are a bit hesitant to ask certain things, that's why you might just stay back or you might just think, forget it "

But teaching in seminars was really good coz the lectures were really clear and the explanations were really clear and the groups were much smaller so you could understand

them.
I was going to say I don't about that, but sometimes in a lecture I just sit there and just wait for the talking to stop but I don't actually learn there, so when I am coming to revise that's when I get all my questions.
You know like our 3rd year lectures that we have got, is there any chance that they could record them?
I think interactive ones are good coz you are more likely to remember things by asking questions remember, so interactive is good
it was about 8 people, about the same size as this. So we still got a lot from it but its more personal you know what I mean?
Again yes smaller because in the seminars you felt like you could ask the tutor where if you were in a big lecture theatre you feel like it is a silly question and you might not ask it, whereas other people probably won't know either.

Inclusion of external resources to supplement learning

Perhaps surprisingly , some students were already using external videos to supplement their learning. The vast majority of these cited YouTube as their preferred internet site to do this:

" its something that I kinda just do at home, you have You Tube up along with a lecture or something just to go through it yourself "

" If I don't get something, I just YouTube it and it just shows me it "

" if I don't understand something, I just type it into YouTube and there will be a video or a few videos I can though "

Other internet sites were also used, and students expressed how these external websites were adding to their knowledge because it was providing information that either wasn't in the curriculum or was unclear from their current teaching:

" when I go and do things myself sometimes, just go on Wikipedia to get an understanding but coz in lectures I don't understand it "

" I use Instagram now … I pick up skills from that which we haven't been taught yet … I just learn different techniques from even Instagram. Social media is a big tool nowadays "

(seminars) and it was good that they had exercise sheets which were like in a question and answer afterwards coz it just meant that everything you had learnt in the seminar you could actually apply it question answer and wise
I'll just makes notes but not just from lectures but from like from You Tube videos like explain different processes
I use You Tube for like preps for crowns and stuff, like sometimes before I have a clinic, erm if I'm doing it, that's the only things I use it for
You Tube used to quite confuse me because they could be from America or somewhere else that's like an English language but they do it completely different to how we do it and I'm thinking of my goodness what am I meant to be doing, what am I meant to be learning?
(about YouTube) I understand why they can do that, but you'll get a few different videos for the same topic you know what I mean, its just finding the right one but I do agree that sometimes it can be completely different ways to what we do, and if we did that as our answer or our technique then it wouldn't work, or we wouldn't get it right or whatever.
I used to use You Tube videos a lot in my old degree for learning like physiology, like PBL stuff, so you watch people draw things, so they would draw it out, like hand drawn tutorial type of things and they would explain like physiology stuff like cells and things. It was nice it was just like watching a video basically, like you are watching a cartoon on blood cells!!
No its something that I kinda just do at home, you have You Tube up along with a lecture or something just to go through it yourself.
(regarding YouTube) I still use it for like handouts and stuff.
I always go on images if I'm looking for an explanation for something.
when I go and do things myself sometimes, just go on Wikipedia to get an understanding but coz in lectures I don't understand it
Do you know what, I feel that animation is pretty good as well but I know it's a lot of money to do that and if there is a 3D animation of how it works in time or something like that so you could see the movement or protrusion
I use You Tube a lot actually.
If I don't get something, I just YouTube it and it just shows me it like
Just how appliances work, or like, or stuff like occlusion or crown preps like, I am always watching videos and that
There are loads of techniques like, doing dentistry is not something that's black and white, people are using their own techniques as well but if it not something that we have been taught and it is not in our exam, we might talk about something why you doing this, we are all going to be looking outside like that as well so if there was a basic video series on Vital for just us lot kinda thing, so we know we can fall back on this and it has been vetted by the department
So maybe if you found the links that you would think are suitable for our learning, so that we can just click on that You Tube link rather than us looking at left, right and then so were looking at what you would be expecting us to know for our exams
I think with the videos, I like the fact that it was like a 3D orientation of it, so when you are using the wire cutters like just looking at a picture of it, or being used in the mouth, to actually see it being done and having the orientation of it there is really helpful, even with like appliance if you just see a picture in a lecture, unless I see the exact picture same again, I'm less likely to know. If it is on a video and its orientated things like that, its good
Yeh I use You Tube quite a lot.
I use YouTube a lot.
And if I don't understand something, I just type it into YouTube and there will be a video or a few videos I can though.
There's a couple of times where I have used You Tube and it's contradictive to what we've been taught and you know tutors are like don't use You Tube just stick to what weve taught you.
I mean I use Instagram now coz I follow so many Instagram pages that it shows me how to do a perfect composite and I pick up skills from that which we haven't been taught yet, other than that advanced composite course but yeh I just learn different techniques from even Instagram. Social media is a big tool nowadays.

Increased clinical exposure

A substantial number of students suggested that they would benefit from increased exposure on the orthodontic clinic referring to the limited and sometimes non-existent time they currently receive.

" I liked the practical bit coz then we just ended up asking questions at the time, so like for this case would it be this this and this and then we ended up getting taught it on a smaller scale and that was actually the best part of the week "

Didn't we used to have like, I mean I am aware but never had it but like they used to have ortho clinics, the year before us used to but we never got any of that.
Its because we never get any time on clinic, do we? I think I have had one clinic this year and didn't do anything, just looked at I know they used to do clinics where students could do stuff within reason, I know we are not orthodontists, but even just to watch or to be involved a little bit more would help me.
Most of the time everything you do is patient dependent and so the text book obviously they can only give you maybe one or two examples whereas if you are constantly seeing throughout clinics yo can see it.
Yeah I like the flipped classroom with the practical element as well, erm because that is really important to my style of learning, its something we don't get a huge amount of experience with.
I think more clinical exposure to orthodontics, I've not had a single ortho clinic in my entire experience here, though we are going to be expected to manage emergencies, I have not seen anyone with a fixed appliance on or with a removable appliance. I think I would need to be more comfortable in that situation. I might be put in that situation.
They definitely help but there is nothing like actually being there nothing can replace that but the videos do like make some way towards it.
Agreed, the same, not had a single ortho clinic, erm so more practicals. I think the lectures do serve a purpose for revision and passing the exam but I think the videos would definitely help understand things more in terms of what you would do in a certain situation.
I think it would be useful to have like a practical on a lot about the removable appliances and things like that coz I've been shown photos of them but it is quite difficult to actually see how they work and why the work, its better if you have actually got an example in front of you, much more likely to retain the knowledge rather than just learn this is for a Class II or whatever.
Yeah I completely agree, I think more experience in clinics, coz we get a lot of tested on what is the IOTN of this and we are given a picture and it says like the overjets 4 mm whatever, but it would nice to actually physically do an examination on a real patient, not just be given that information coz until you have physically done it, I don't think, well I think with me I don't completely understand it unless I have physically done it, so I think that would definitely help.
maybe seeing an orthodontist doing an assessment would be really useful and then if we can have a chat about what they are doing and see it a bit more, that would help so much more, like learning IOTN and trying to apply all that and erm we have already mentioned about the block of lectures in 3rd year, I think that need to be completely scrapped, because it is just not useful to anyone, to like staff and students.
I think that the only ortho things I can actually do is skeletal Class, that's the only thing I can do, like I don't know how to measure overjet properly like, just models but its not like real, even when we did the cases, like this patient has overjet of whatever what treatment plan would you do, its like we are, but give us models but where are the actual appliances, how can we do just do oh yeh number 1 is appliance 2 its a twinlock or whatever, like we need to

see it. Not just like pictures but like sure you know what I mean?
If its something practical, then learning and reading so say endo that just doesn't go in until I actually do it, so yeh it completely depends.
with lectures you can sort of see it without having to actually do it, but I think its better probably to do it, but that's a second best option.
The biggest problem I had with ortho is appliances, I feel like not being able to see them, is one thing that I hated, that I had to find pictures myself of every appliance and make my own little chart of something. And functions, like what they do.
yeah it would be nice to see them in real life as well.
yeh it's been good, but we don't get much time in orthodontic clinics either, I think that's a disadvantage for us.
It would be good to see a lot, like you could see the appliances on clinic and see a lot more stuff.
Well I haven't I think some people might have just got to observe but they just stopped that for our year.
We haven't even seen some of those examples in orthodontics, so literally like a lecture series and that's it.
I think erm going to ortho clinic one day and maybe doing some hands on stuff, if you could that would be pretty good too because you are using the appliances and I don't know what we would be allowed to do, but it would help just one day.
and just like being able to see it and even going onto clinic, the only ortho experience I have is seeing oral med patients on oral surgery consultation clinics where they have to remove polyps because of trauma, that's the only experience I have had with braces, so yesterday was the first time I have seen fixed appliances and just like for revision I was looking at everything with the mirror and trying to figure out all the bits and pieces but that's the only ortho experience I can say I have had.
So for instance, quite a lot of the ortho questions because we don't have any clinical sessions really for ortho, a lot of it, even though it makes sense when you read it, when you ask questions about it, it doesn't quite make sense to me if that makes sense, whereas if you have a session of doing it, you can actually link it in better.
some lectures do like have cases and that's really useful.
Or a practical thing how we are seeing they work and the specialist can explain in small groups.
Yeh I agree, even like maybe being the opportunity to go onto clinic as well, because like we are all 5th years and we are about to leave soon, like none of us or the majority haven't even measured something so simple as an overjet, I mean it's pretty poor really.
So we don't know how to do that, and that's stuff that we do need to know coz that's the stuff a GDP does do!!!!
Like I feel like oh yeh its all good and well to know what like I don't know like what a twin block does and like we've got a couple of lectures on it but none of us know how to use a ruler to measure an overjet because we've not just done it.
What I think would be useful as well because we see on paeds clinic we sell all the guys in green ortho stuff but we have never been over that side, it would be useful to have maybe one or two clinics on it just to shadow someone, and see exactly what they do, see them bring in a patient and do the IOTN or do some cephalometrics.
I have never had braces so I haven't actually seen a fixed appliance
I do obviously think about that, my own teeth when I think about ortho to think like, did I ever have this, does this make sense at all like because like it's the only thing I can relate it to.
I had a twin block, I understand what a twin block is, but if I didn't have one I don't think I'd know.
Yeh I think 100% practical thing, have a different appliances even on models, and a specialist explaining ok this is how it works, this is the biology of tooth movement, this is what functional appliances do like they are like tipping teeth and you know, fixed appliances are like actually..
We did have these seminars where we worked through like cases, but these cases were cases that like I think that the postgrads were treating and we had to like do a treatment plan, yeh it as good but how does that benefit us when we are learning to be GDPs.
So I know people will like you know might end up specialising but they will do a course to do that so they will get taught on that course, well the majority of us are going to be GDPs.

Overarching Theoretical Perspective

It became clear that the participants were describing a process whereby, they:

1. Experienced a new form of teaching
2. Reflected on that teaching in terms of its advantages and disadvantages related to themselves
3. Formed conclusions based on that teaching (an improvement in their awareness of their own learning needs was gained)
4. Suggested ways in which their future teaching could be improved based on these conclusions formed.

This pattern is very much in keeping with a process of say cool of learning similar to and experiential learning cycle, similar to the model described by Kolb.

Chapter 8: Discussion

8.1: Limitations of the study

After careful consideration, there are number of limitations of this study. This will be explored in two ways. The first will be the quantitative limitations and the second will be qualitative limitations.

8.1.1: Quantitative Limitations

The formative single best answer examination lasted one hour and consisted of 15 questions related to orthodontics. Although not necessarily a limitation, having an examination for more than one hour would not have been possible. The decision to create an examination lasting one hour was because of the time available between lectures and also the authors felt as if one hour would be sufficient. Having 15 questions obviously had an impact on the length of the exam and again that authors felt that 15 questions were sufficient.

Questions were carefully chosen so that students had not seen any questions before in any other examination and would not see the same questions in their summative Final degree examinations. The questions selected were standard set by previous cohorts, meaning that the correct level of difficulty.

The single best answer sheets were marked electronically, eliminating the possible limitation of human error.

8.1.2: Qualitative Limitations

Reflexivity is where the background and opinions of the researcher inevitably affects everything from the chosen investigation, the methods judged most appropriate for the chosen angle of enquiry, the findings, and the way that the conclusions are conveyed. (130) Rather than an introduction of bias, if the reader is made aware of

these influences and a clear statement of such influences are made, a richer, more developed understanding of complex phenomena will be gained.

Focus Groups

When conducting the focus groups, the main researcher tried to avoid introducing bias in the following ways:

- The focus groups were conducted in a nonclinical setting.
- The main researcher wore casual clothes.
- At the beginning of each focus group, participants were told that their responses would be kept confidential and it was a safe environment for them to disclose their true feelings about any topic they wanted to discuss.
- Where possible the main researcher tried to ask non-specific and open ended questions. These questions were constructed in such a way that meant that the main researcher tried not to influence any responses from the participants.
- The topic guide was used appropriately, giving opportunity to pursue interesting responses from the participants but at the same time maintained a semi structured design.
- Every participant and the focus group was asked to participate. This ensured that all opinions were collected and that the true opinions were collected from the representative sample.
- The content of the focus groups was transcribed verbatim. The inclusion of disfluencies such as ‘um’ and ‘er’ were included in the transcripts as they occurred within the flow of speech.
- The main researcher then checked the consistency of their transcription against the voice recording and made any appropriate changes

- During the focus groups a reflexive diary containing contemporaneous reflections was used.

8.2: Strategies Used To Avoid Common Errors In Qualitative Data Collection And Analysis

Transcription Errors

A common error in qualitative research is the omission or alteration of the data in its raw state and transcription. In order to reduce these errors, the following steps were taken:

- Sentence structure errors - The transcripts are completed using 'spoken language', where punctuation was not added to the data to form sentences. This was done so that subsequent interpretation of the text would not be altered in any way.
- Omission errors - These errors include situations where words or even vocalised sounds are not included. Sometimes they may be inconsequential but at other times they maybe crucial. This was the case when more than one participant was talking at the same time.
- Mistaking words or phrases errors - These errors are where the wrong word or phrase are documented in the transcript. The process of transcription requires a great deal of concentration and focus spanning a substantial amount of time. It is therefore important to have a break at regular intervals.
- Fatigue – if the interviewer is not taking adequate rest between focus groups, taking time to reflect and document the content explored then the subsequent focus groups maybe susceptible to several different forms of bias. The main researcher took adequate time between the focus groups to ensure that this did not happen.

- Poor quality recordings – The recordings were digitally recorded meaning that during the process of transcription, the volume could be increased where necessary. Digital recordings also prevent the recording is being altered due to cassettes being worn out through over-use.

Analysis

One of the most important considerations for any qualitative researcher is that the researcher themselves is responsible for highlighting what aspect of the data they feel is important or significant. Ideally, another researcher should be able to analyse the same data, in the same way and arrive at the same categories and overall theoretical perspective, perhaps with subtle differences in what they consider to be the order of importance within the data. One way of trying to ensure that this occurs is to have the data analysed by an independent researcher and then compare findings afterwards. Often researchers will have a discussion within the research team to discuss each other's opinions and differences and explore ways of creating a valid and reliable set of conclusions from the data. In this study, the main researcher allowed the rest of the research team access to the data and invited discussion about the categories formed and conclusions reached. No changes to the categories or overall theoretical perspective were needed. Minor corrections were advised in the wording of some of the categories and subcategories in order to incorporate the full dataset.

8.4: Generalisability

This study was in a single context of final year students in a five-year undergraduate curriculum studying orthodontic emergencies. Our findings, therefore, cannot be generalised to other contexts, such as other year groups or specialities. Systematic reviews on the outcomes of the flipped classroom

suggest that outcomes are often not generalisable to other contexts.

(117)(119)(130)

8.5: Applicability of Results

The population from which the participants were recruited were cuurent final year dental students at The University of Liverpool. Males and females were included from all ethnic backgrounds. This was in an attempt to increase the generalisability of the results.

Using a population from a university teaching hospital means that the results of this study may be applicable to students studying at different higher education institutions. The setting in an NHS Dental Hospital was common to many cities in the UK. Despite this, the fact that it was only set in the dental hospital in Liverpool may limit the generalisability of the results to some extent due to variations in the populations studying in and around the UK. Ideally, the study could be expanded to include different settings and potentially a multi-centre study so that the results would be generalisable nationwide.

The sample for the current study was a sample of convenience, as the aim was to recruit a large enough sample to detect a significant difference in the formative examination results between the test and control groups. However, the sample was not selected randomly, thus the risk of selection bias must be considered. Despite efforts to reassure students that they would not be treated any differently if they choose not to take part in the study, an increased number of students may have chosen to participate as they felt that they would be treated differently than if they did not.

8.6: Implications For Future Teaching

There flipped classroom method of teaching has been shown to produce comparative examination results and improved levels of student satisfaction compared with conventional teaching methods, spanning many disciplines. Future teaching should aim to incorporate many different methods of teaching when looking to deliver a rich and diverse curriculum. In the United Kingdom today there are an abundance of potential students looking to further their education at higher institutions. With so many different options in terms of location and curriculum, higher education institutions should aim to offer several different styles of teaching in order to improve the satisfaction levels of these potential students.

Within the speciality of orthodontics, there are few institutions in the United Kingdom that provide teaching on orthodontic emergencies for undergraduate students. The video was made in this study, may provide the perfect solution for academic leads who seek to provide teaching in a cost-effective and time efficient way.

8.7: Implications For Future Research

The implications of successfully demonstrating that the flipped classroom method positively impacts clinical practice would be invaluable. Therefore, it would be of interest to conduct this research as a multi-centre, prospective study to assess whether the results are similar across the UK.

Relating to orthodontics, future research should look to focus on qualitative research and student satisfaction levels with different teaching methods.

8.8: Ethics and Regulatory Approvals

The study was conducted in compliance with the principles of:

- The Declaration of Helsinki (1996)
- The principles of GCP
- The Research Governance Framework and the Medicines for Human Use (Clinical Trial) Regulations 2004, as amended in 2006 and any subsequent amendments.

The University of Liverpool research ethics committee approved this fully mixed sequential randomised controlled trial with dominant qualitative status on 28/11/17. (I.D. 1605).

8.9: Direct Access to Source Data and Documentation

The Investigator(s) permitted study-related monitoring, audits and regulatory inspections (where appropriate) by providing direct access to source data and other documents (i.e. participant examination results, qualitative data etc).

The Main researcher (GI) is acting as custodian for the study data. The following guidelines were strictly adhered to:

- All data was collected on a standardised and pseudo-anonymised data collection sheet
- Any data stored was pseudo-anonymised by the allocation of a study identifier.
- The code for the identifier stored in a locked separate location (GI office).
- All anonymised data were stored on a password-protected computer and all analysis paperwork was kept in a locked drawer in the investigators office, which had a key padlock and was locked at all times.

- All study data was stored and archived in line with the Medicines for Human Use (Clinical Trials) Amended Regulations 2006 as defined in the Joint Clinical Trials Office Archiving SOP.
- After the study has ended, pseudonymised data will be stored on a hospital Trust computer, by the main researcher, which will be password protected for 5 years.

8.10: Quality Assurance

Monitoring of this study will be to ensure compliance with Good Clinical Practice and scientific integrity, was managed and oversight retained by the Co-sponsors (University/Trust).

8.11: Publication Policy

It is intended that the results of the study will be reported and disseminated at international conferences and in peer-reviewed scientific journals. The information also forms part of a research thesis submitted in partial fulfilment of a D.D.Sc at the University of Liverpool.

8.12: Financial Aspects

Small monies were sought from the D.D.Sc research fund (Orthodontic Department) that were used to buy appropriate stationary for the patient information leaflets, and consent forms.

Chapter 9 – Conclusions

- A virtual learning environment such as “VITAL” (Virtual Interactive Teaching At Liverpool) can be used to help deliver flipped classroom teaching of

orthodontic emergencies to undergraduate dental students in their fifth year of study.

- Comparable quantitative examination results were achieved between the two forms of teaching. The flipped classroom group performed slightly better, although the difference was not statistically significant.
- Qualitative analyses demonstrated that students' perceptions of flipped classroom teaching were very positive.
- The flipped classroom method of teaching stimulated students' to think more deeply about the material, stimulating a cyclical model or higher level thinking, similar to that of an experiential learning cycle.
- Flipped classroom teaching resulted in comparable examination performance and improved levels of student satisfaction when compared with conventional lecture based teaching.

References

1. Jones K, Popat H, Johnson IG. Dental students' experiences of treating orthodontic emergencies - a qualitative assessment of student reflections. Eur J Dent Educ [Internet]. 2016;20(3):156–60. Available from: http://doi.wiley.com/10.1111/eje.12155
2. GDC. Preparing for practice-dental team learning outcomes for registration [Internet]. [cited 2017 Jul 1]. Available from: Preparing for practice-dental team learning outcomes for registration
3. Cowpe J, Plasschaert A, Harzer W, Vinkka-Puhakka H WA. Profile and competences for the graduating European dentist. Eur J Dent Educ. 2010;14:193–202.
4. Royal College of Surgeons of England. Methodologies for Clinical Audit in Dentistry. 2000.
5. Sodipo I BJ. Orthodontic First Aid for General Dental Practitioners. Dent Update. 2016;43:461–71.
6. Honey J, Lynch CD, Burke F GA. Ready for practice? Astudy of confidence levels of final year dental students at Cardiff University and University College Cork. Eur J Dent Educ. 2011;15:98–103.
7. Patel J, Fox K, Grieveson B YC. Undergraduate training as preparation for vocational training in England: a survey of vocational dental practitioners' and their trainers' views. Br Dent J. 2006;201:9–15.
8. Fleming P DP. A survey of undergraduate orthodontic training and orthodontic practices by general dental practitioners. J Ir Dent Assoc. 2004;51:68–72.
9. Teller E, Teller W TW. Hypotheses non fingo. Chapter 5 in: Conversations on the Dark Secrets of Physics. 1st Ed. Cambridge, MA.: Perseus Publishing; 1991.
10. Freire P. Pedagogy of the Oppressed. New York, NY: Herder and Herder, New York; 1970.
11. Driscoll M. Psychology of Learning for Intruction. Boston, MA: Allyn and Bacon; 1999.
12. Knowles M. The Modern Practice of Adult Education: From Pedagogy to Andragogy (2e). New York, NY: Cambridge Books; 1980.
13. Bandura A. Social Foundations of Thought and Action. A Social Cognitive Theory. Englewood Cliffs, NJ.: Prentice-Hall; 1986.
14. Schön D. The Reflective Practitioner: How Professionals Think in Action. New York, NY: Basic Books; 1983.
15. Mezirow J. Understanding transformation theory. 1994. 44(4):222– 44. Adult Educ Quarterly. 1994;44(4):222–44.
16. Candy P. Self-Direction in Lifelong Learning. San Francisco, CA.: Jossey-Bass; 1991.
17. Kolb D. Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, NJ.: Prentice Hall; 1984.
18. Lave E, Wenger J. Situated Learning: Legitimate Peripheral Participation. New York, NY: Cambridge University Press; 1991.
19. Wenger E. Communities of Practice: Learning, Meaning, and Identity. New York, NY: Cambridge University Press; 1998.
20. Selman P, Dampier G. The Foundations of Adult Education in Canada. Toronto, ON.: Thompson Educational Publishing; 1990.
21. Verner C, Booth J. Adult Education. New York, NY.: Centre for Applied Research in Education; 1964.

22. Jarvis P. The Sociology of Adult and Continuing Education. London: Croom Helm; 1985.
23. Darkenwald G, Merriam S. Adult Education: Foundations of Practice. New York, NY: Harper & Row; 1982.
24. Merriam S. Adult learning and theory building: a review. Adult Educ Q. 1987;37(4):187–98.
25. Cross K. Adults as Learners . San Francisco, CA.: Jossey-Bass; 1981.
26. Knox A. Proficiency theory of adult learning. Contemp Educ Psychol. 1980;5:378–404.
27. McClusky HY. An approach to a differential psychology of the adult potential (ed.) Adult Learning and Instruction. Edn. Grabowski SM, editor. Syracuse, NY.; 1970. 80–95 p.
28. Mezirow J. A critical theory of adult learning and education. Adult Educ Q. 1981;32:3–27.
29. Merriam S, Caffarella R BL. Learning in Adulthood: A Comprehensive Guide. 3rd Edn. San Francisco, CA.: Jossey-Bass; 2007.
30. Dewey J. How we think: a restatement of the relation between reflective thinking to the educative process. London: DC Heath; 1933.
31. Boyd E, Fales A. Reflective Learning: key to learning from experience. J Humanist Psychol. 1983;23:99–117.
32. Boud D, D W. Barriers to reflection on experience. Boud D, Cohen R, Walker D, editors. Milton Keynes: Open University Press; 1993. 73–86 p.
33. Kolb D, Fry R. Towards an applied theory of experiential learning. Cooper, editor. London: John Wiley and sons; 1975.
34. Sparks-Langer G, Colton A. Synthesis of research on teachers reflective learning. Educ Leadersh. 1991;48:37–44.
35. Ross D. Programmic structures for the preparation of reflective teachers. Clift R, Houston W, Pugach M, editors. New York: Teachers College Press; 1990.
36. Swanick T. Understanding medical education. 1st ed. Swanick T, editor. Oxford: wiley-blackwell; 2010. 105 p.
37. Mezirow J. Transformative Dimensions of Adult Learning. J Contin Educ Health Prof. 1991;10(3):237–43.
38. Mezirow J. Fostering Critical Reflection in Adulthood. San Francisco, CA.: Jossey-Bass; 1990.
39. Cranton P. Understanding and Promoting Learning: a guide for educators of adults. San Francisco, CA.: Jossey-Bass; 1994.
40. Zimmerman B. Becoming a self-regulated learner: Which are the key subprocesses? Contemp Educ Psychol. 1986;11:307–13.
41. Locke EA LG. A Theory of Goal Setting and Task Performance. Englewood Cliffs, NJ.: Prentice Hall; 1990.
42. Winne PH. NExperimenting to bootstrap self-regulated learning. J Educ Psychol. 1997;89:397–410.
43. Deci EL, Vallerand RJ, Pelletier LG RR. Motivation and Education: the self determination perspective. Educ Psychol. 1991;26:325–46.
44. Ryan RM. DE. Intrinsic and extrinsic motivations: classic definitions and new directions. Contemp Educ Psychol. 2000;25:54–67.
45. Perry W. Forms of Intellectual and Ethical Development in the College years: a scheme. New York, NY: Holt, Rinehart and Winston; 1970.
46. Kolb D. Experiencial Learning. Upper Saddle River, NJ: Prentice Hall; 1984.
47. Zimmerman B. Attaining self regulation: a social-cognitive perspectives. In: Boekaerts M, Pintrich PR and Zeidner MH (eds) Handbook of Self Regulation. San Diego, CA: Academic Press; 2000. 13–39 p.
48. Winne PH. Minimizing the black box problem to enhance the validity of theories about instructional effects. Instr Sci. 1982;11:13–28.
49. Grow G. Teaching Learners to be self directed. Adult Educ Q. 1991;41:125–

49.
50. Butler, DL; Winne P. Feedback and self regulated learning: a theoretical synthesis. Rev Educ Res. 1995;65:245–81.
51. Shokar, GS; Shokar, NK; Romero CBR. Self-directed learning: looking at outcomes with medical students. Fam Med. 2002;34:197–200.
52. Andrews GR; Debus RL. Persistence and the casual perception of failure: modifying cognitive attributions. J Educ Psychol. 1978;70:154–66.
53. Sadler D. Formative Assessment and the design of instructional systems. Instr Sci. 1989;18:119–44.
54. Baker L. Children's effective use of multiple standards for evaluating their comprehension. J Educ Psychol. 1984;76:588–97.
55. Chi M. Constructing self-explanations and scafolded explanations in tutoring. Appl Cogn Psychol. 1996;10:1–17.
56. Weiner B. Attribution Theory, achievement motivation and the educational process. Rev Educ Res. 1972;42:203–15.
57. Prawat R. Current self-regulation views of learning and motivation viewed through a Deweyan lens: the problems with dualism. Am Educ Res J. 1998;35:199–224.
58. Lewin K. Field Theory in Social Sciences. New York: Harper & Row; 1951.
59. Dewey J. Experience and Education. New York: Touchstone; 1938.
60. Piaget J. Psychology and Epistemology. Harmondsworth: Penguin Books; 1971.
61. Holzer S, Andruet R. A Multimedia workshop learning environment for statics. ASEE Conference. In Blacksburg, VA; 1998.
62. Fry R, Kolb B. Experiential learning theory and learning experiences in liberal arts education. New Dir Exp Learn. 1979;6:79–92.
63. Brown J, Collins A, Duguid P. Situated cognition and the culture of learning. Educ Reasercher. 1989;18:32–42.
64. Hafferty F, Franks R. The hidden curriculum, ethics, teaching and the structure of medical education. Acad Med. 1994;69:861–71.
65. Barab S, Barnett M, Squire K. Developing an empirical account of a community of practice: characterizing the essential tensions. J Learn Sci. 2002;11(4):489–542.
66. Henri F, Pudelko B. Understanding and analyzing activity and learning in virtual communities. J Comput Assist Learn. 2003;19:474–87.
67. Parboosingh J. Physician communities of practice where learning and practice are inseperable. J Contin Educ Health Prof. 2002;22:230–6.
68. Richardson B, Cooper N. Developing a virtual interdisciplinary research community in higher education. J Interprof Care. 2003;17(2):173–82.
69. White C, Thomas A. Students assigned to community practices for their paediatric clerkship perform as well or better on written examinations as students assigned to academic medical centres. Teach Learn Med. 2004;16(3):250–4.
70. Kerka S. Teaching Adults: Is it Different? http://www.calpro-online.org/eric/docs/mr00036.pdf. 2002.
71. Cervero, R; Wilson A. Beyond Learner-Centered Practice: Adult Education, Power, and Society. Can J Study Adult Educ. 1999;13(2):27–38.
72. Beder H. Teaching in Adult Literacy Education: Learner-Centered Intentions, Teacher-Directed Instruction. In: Proc 42nd Annu Adult Educ Res Conf.
73. Resnick L. Learning in school and out. Educ Res. 1987;16:13–20.
74. Ofcom. Adults' media use and attitudes report.
75. Kulik, CLC.; Kulik J. Effectiveness of computer-based instruction: An updated analysis. 1991;7(1-2):75–94. Comput Hum Behav. 1991;7(1–2):75–94.
76. Turner, PJ.; Weerakone S. An evaluation of a hypertext system for computer-assisted learning in orthodontics. 1993;20(2):145–8. Br J Orthod Orthod.

1993;20(2):145–8.
77. Cohen D LL. Computer-Based Instructions and Health Professions Education: A Meta-Analysis of Outcomes. 1992;15(3):259–81. Eval Heal Prof. 1992;15(3):259–81.
78. Al-Jewair, Thikriat S.; Azarpazhooh, Amir; Suri, Sunjay; Shah PS. Computer-Assisted Learning in Orthodontic Education: A Systematic Review and Meta-Analysis. J Dent Educ ■. 73(6).
79. Aly, M.; Elen, J.; Willems G. Instructional multimedia program versus standard lecture: a comparison of two methods for teaching the undergraduate orthodontic curriculum. 2004;8(1):43–6. Eur J Dent Educ. 2004;8(1):43–6.
80. Komolpis, R.; Johnson R. Web-based orthodontic instruction and assessment. J Dent Educ. 2002;66(5):650–8.
81. Lowe, CI.; Wright, JL.; Bearn D. Computer-aided learning (CAL): an effective way to teach the index of orthodontic treatment need (IOTN)? J Orthod. 2001;28(4):307–11.
82. Rosenberg H. An evaluation of computer-aided learning in orthodontics. University of Toronto; 2008.
83. Crouch, C.; Mazur E. 'Peer Instruction: Ten Years of Experience and Results.' Am J Phys. 2001;69(9):970–7.
84. Baker J. The "Classroom Flip": Using Web Course Management Tools to Become the Guide by the Side. In: Communication Faculty Publications. 2000. p. 15.
85. Lage, M.; Platt, G.; Treglia M. Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment. J Econ Educ. 2000;31(1):30–43.
86. Riechmann, S.; Grasha A. A Rational Approach to Developing and Assessing the Construct Validity of a Student Learning Style Scales Instrument. J Psychol. 1974;87(2):213–23.
87. Initiative. EL. 7 Things you should know about flipped classrooms (Internet). Educ Learn Initiat. 2012;1–2.
88. Khanova, J.; McLaughlin, J.; Rhoney, D.; Roth, M.; Harris S. Student Perceptions of a Flipped Pharmacotherapy Course. Am J Pharm Educ. 2015;79(9):1–8.
89. Ertmer, P.; Newby T. Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. Perform Improv Q. 1993;6(4):50–70.
90. Fenwick T. Conceptions of experiential learning: a review of the five contemporary perspectives on cognition. Adult Educ Q. 2000;50(4):243–72.
91. Calimeris L SK. Flipping out about the flip: All hype or is there hope? Int Rev Econ Educ. 2005;20:13–28.
92. Foldnes N. The Flipped Classroom and Cooperative Learning: Evidence from a Randomised Experiment. Act Learn High Educ. 2016;17(1):39–49.
93. Mason G, Shuman T, Cook K. Comparing the Effectiveness of an Inverted Classroom to a Traditional Classroom in an Upper-Division Engineering Course. Trans Educ. 2013;56(4):430–5.
94. Gross, D.; Pietri, ES.; Anderson G et al. Increased preclass preparation underlies student outcome improvement in the flipped classroom. CBE Life Sci Educ. 2015;14(4):1–8.
95. Mortensen CJ NAM. Teaching equine courses in the flipped format is proving to be a modern approach to today's classrooms. J Equine Vet Sci. 2015;35(5):451.
96. Ojennus D. Assessment of learning gains in a flipped biochemistry classroom. 2015;20–7. Biochem Mol Biol Educ. 2015;20–7.
97. Yestrebsky Y. Flipping the Classroom in a Large Chemistry Class-research University Environment. Soc Behav Sci. 2015;191:1113–8.

98. O'Flaherty J PC. The use of flipped classrooms in higher education: A scoping review. Internet High Educ. 2015;25:85–95.
99. Betihavas, V.; Bridgman, H.; Kornhaber, R.; Cross M. The evidence for "flipping out": A systematic review of the flipped classroom in nursing education. Nurse Educ Today. 2015;
100. Liebert, C.; Lin, DT.; Mazer, LM.; Bereknyei, S.; Lau J. Effectiveness of the Surgery Core Clerkship Flipped Classroom: A prospective cohort trial. Am J Surg. 2015;211(2):451–7.e1.
101. Wong, TH.; Ip, EJ.; Lopes, I.; Rajagopalan V. Pharmacy students' performance and perceptions in a flipped teaching pilot on cardiac arrhythmias. Am J Pharm Educ. 2014;78(10):1–5.
102. Park, SE.; Howell T. Implementation of a Flipped Classroom Educational Model in a Predoctoral Dental Course. J Dent Educ. 2015;79(5):563–70.
103. Bunce, L.; Baird, A.; Jones S. The student-as-consumer approach in higher education and its effects on academic performance. Stud High Educ. 2016;5079 (Febr:1–21.
104. Gilboy MB, Heinerichs S PG. Enhancing student engagement using the flipped classroom. J Nutr Educ Behav. 2015;47(1):109–14.
105. McLaughlin J, Roth M, Glatt D, Gharkholonarehe N, Davidson C, Griffin L, et al. The Flipped Classroom: A Course Redesign to Foster Learning and Engagement in a Health Professions School. Acad Med. 2014;89(2):1–8.
106. Roach P, Drummond N. "It's nice to have something to do": early-onset dementia and maintaining purposeful activity. J Psychiatr Ment Heal Nurs. 2014;21(10):889–95.
107. Abeysekera L, Dawson P. Motivation and cognitive load in the flipped classroom : definition, rationale and a call for research. High Educ Res Dev. 2015;34(1):1–14.
108. Delozier S, Rhodes M. Flipped Classrooms: a Review of Key Ideas and Recommendations for Practice. Educ Psychol Rev. 2016;29(1):141–51.
109. Zainuddin Z, Halili S. Flipped Classroom Research and Trends from Different Fields of Study. Int Rev Res Open Distrib Learn. 2016;17(3):313–40.
110. Tawfik A, Lilly C. Using a Flipped Classroom Approach to Support Problem-Based Learning. Technol Knowl Learn. 2015;20(3):299–315.
111. Nguyen B, Yu X, Japutra A, Chen C-H S. Reverse teaching: Exploring student perceptions of "flip teaching." Act Learn High Educ. 2015;17:51–61.
112. Findlay-Thompson S, Mombourquette P. Evaluation Of A Flipped Classroom In An Undergraduate Business Course. Bus Educ Accredit. 2014;6(6):63–71.
113. Evseeva, A.; Solozhenko A. Use of Flipped Classroom Technology in Language Learning. Procedia - Soc Behav Sci. 2015;206 (Novem:205–9.
114. Strayer J. How learning in an inverted classroom influences cooperation, innovation and task orientation. Learn Env Res. 2012;15:171–93.
115. Moraros, J.; Islam, A.; Yu, S.; Banow, R.; Schindelka B. Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. BMC Med Educ. 2015;15:27.
116. Das, B.; Sarkar C. An Innovative Flipped Class Intervention to Improve Dose Calculation Skills of Phase I Medical Students: A Preliminary Study. Soc Behav Sci. 2015;182:67–74.
117. Chen F, Lui A, Martinelli S. A systematic review of the effectiveness of flipped classrooms in medical education. Med Educ. 2017;51:585–97.
118. Cook D, Ellaway R. Evaluating technology-enhanced learning: A comprehensive framework. Med Teach. 2015;37:961–70.
119. Kirkpatrick D. Revisiting Kirkpatrick's four-level model. Train Dev. 1996;50:54–9.
120. Morgan, H.; McLean, K.; Chapman, C.; Fitzgerald, J.; Yousuf, A.; Hammoud M. The flipped classroom for medical students. Clin Teach. 2015;12(3):155–

60.
121. Crothers, AJ.; Bagg, J.;McKenzie R. The Flipped Classroom for pre-clinical dental skills teaching. Br Dent J. 2017;222:709–13.
122. Mark M, Shotland R. Multiple methods in program evaluation:New directions for program evaluation. In: Mark M, Shotland R, editors. Alternative models for the use of multiple methods. San Francisco, CA.: Jossey-Bass; 1987. p. 95–100.
123. Greene J, Caracelli V, Graham W. Toward a conceptual framework for mixed method evaluation designs. Educ Eval Policy Anal. 1989;11(3):255–74.
124. Ziebland S, McPherson A. Making sense of qualitative data analysis: an introduction with illustrations from DIPEx (personal experiences of health and illness). Med Educ. 2006;40:405–414.
125. Collins H, Leonard-Clarke W, O'Mahoney H. "Um, er": how meaning varies between speech and its typed transcript. Qual Res. 2019;1:1–16.
126. Prince M. Does Active Learning Work? A Review of the Research. J Eng Educ. 2004;93(3):223–31.
127. Steen-Utheim AT, Foldnes N. A qualitative investigation of student engagement in a flipped classroom. Teach High Educ. 2018;23(3):307–24.
128. Gibbard LL, Salajan F. A Novel Interactive Online Module in a Traditional Curriculum through a Blended Learning Approach. Electron J e-Learning. 2009;7(3):301–8.
129. Gardner H. Intelligence reframed: Multiple intelligences for the 21st century. 1st ed. New York: Basic Books; 1999. 236–287 p.
130. Malterud K. Qualitative research: standards, challenges, and guidelines. Lancet. 2001;11(358):483–8.

Appendices

Appendix 1: Information Pack and Consent

Information Sheet

Introduction
Liverpool University is committed to delivering the highest quality of teaching for our undergraduate students. We are constantly looking to implement new ways to effectively prepare undergraduate dental students in the early stages of their career. The General Dental Council now expects General Dental Practitioners to be able to appropriately manage orthodontic emergencies in practice. Previous years have noted that after qualification, they have not felt comfortable when dealing with orthodontic emergencies in General Practice.
As a result, we aim to deliver teaching specifically on managing orthodontic emergencies, and wish to investigate the best way to go about this.

Purpose Of The Research
The purpose of the research is to investigate whether orthodontic emergencies can be taught more effectively than it is currently. This is to ensure undergraduate dental students feel comfortable and confident in dealing with orthodontic emergencies prior to graduation. The study is entitled, "Teaching Orthodontic Emergencies Using The "Flipped Classroom" Method – A Randomised Controlled Trial"

Type of Research Intervention
- The first arm of the study will involve students being taught using a lecture alone.
- The second arm of the study will involve students being taught using an online program and a problem solving session during the time allocated for the lecture.
- Every participant will then swap arms meaning they will receive the other method of teach prior to any exams.
- Crucially, this means nobody will be disadvantaged regardless of what arm they are first allocated to.

Participant Selection
We are inviting all 5th year dental students to take part in this study.

Voluntary Participation
Your participation in this research is entirely voluntary. It is your choice whether to participate or not. If you choose not to participate in this research project, you will be given the same treatment that is routinely delivered. You may also change your mind later and wish to stop participating. Again, the quality of teaching you receive will not be adversely affected.

Risks
Since students will receive both types of teaching, there will be no risk of receiving poorer teaching than what is currently delivered.

Benefits
By supplementing the current teaching with an additional method of teaching without extra time in class for students, it is hoped that the learning experience will be enhanced.

Confidentiality
The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will include your name, exam results and your feedback. This will be anonymised where possible and confidentially stored on a password protected file on the University of Liverpool server and nobody but the researchers will be able to see it.

Sharing The Results Of The Study
The knowledge gained from this research will be shared with you via email before it is made widely available to the public. Confidential information will not be shared. Any future publication of the results in scientific journals will be announced prior. This may be done so that other researchers may learn from our work.

Right To Refuse Or Withdraw
You do not have to take part in this research if you do not wish to do so and refusing to participate will not affect your teaching in any way. You will still have all the benefits that you would otherwise have. You may stop participating in the research at any time that you wish without losing any of your rights as a student. Your teaching will not be affected in any way and all of your rights will still be respected following withdrawal.

Alternatives To Participating
If you do not wish to take part in the research, you will be provided with the established standard teaching method available at the University. You will receive the conventional lecture on orthodontic emergencies.

Who To Contact
If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact:

- Dr. Norah Flannigan, Consultant Orthodontist, Liverpool University Dental Hospital (n.l.f@liverpool.ac.uk)

Ethical Approval
This proposal has been reviewed and approved by the University of Liverpool Ethics Review Committee, whose task it is to make sure that research participants are protected from harm.

Certificate of Informed Consent

I have read the information relating to this research project and I have had the opportunity to ask questions about it. Any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

- Print Name of Participant _____

- Signature of Participant _____

- Date _____

Statement by the researcher/person taking consent
I have to the best of my ability made sure that the participant understands that the following will be done:

1. They will be assigned to one of the interventions described in the information sheet
2. Relative exam performance and feedback in the form of focus groups will be collected afterwards
3. Participants will swap arms allowing them to receive the other form of teaching prior to formal exams

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

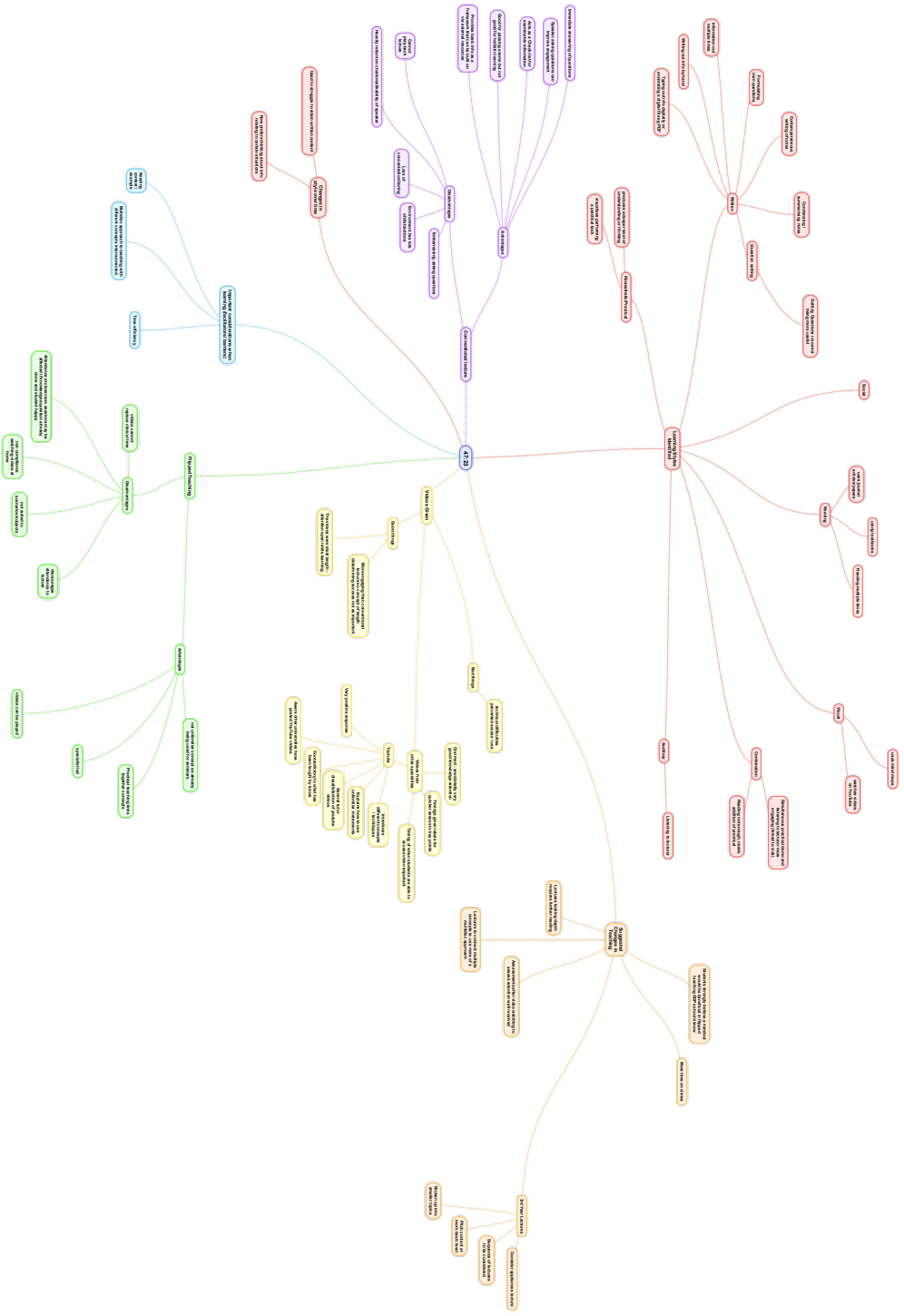
A copy of this informed consent form has been provided to the participant.

- Print Name of Researcher/person taking the consent
  _____

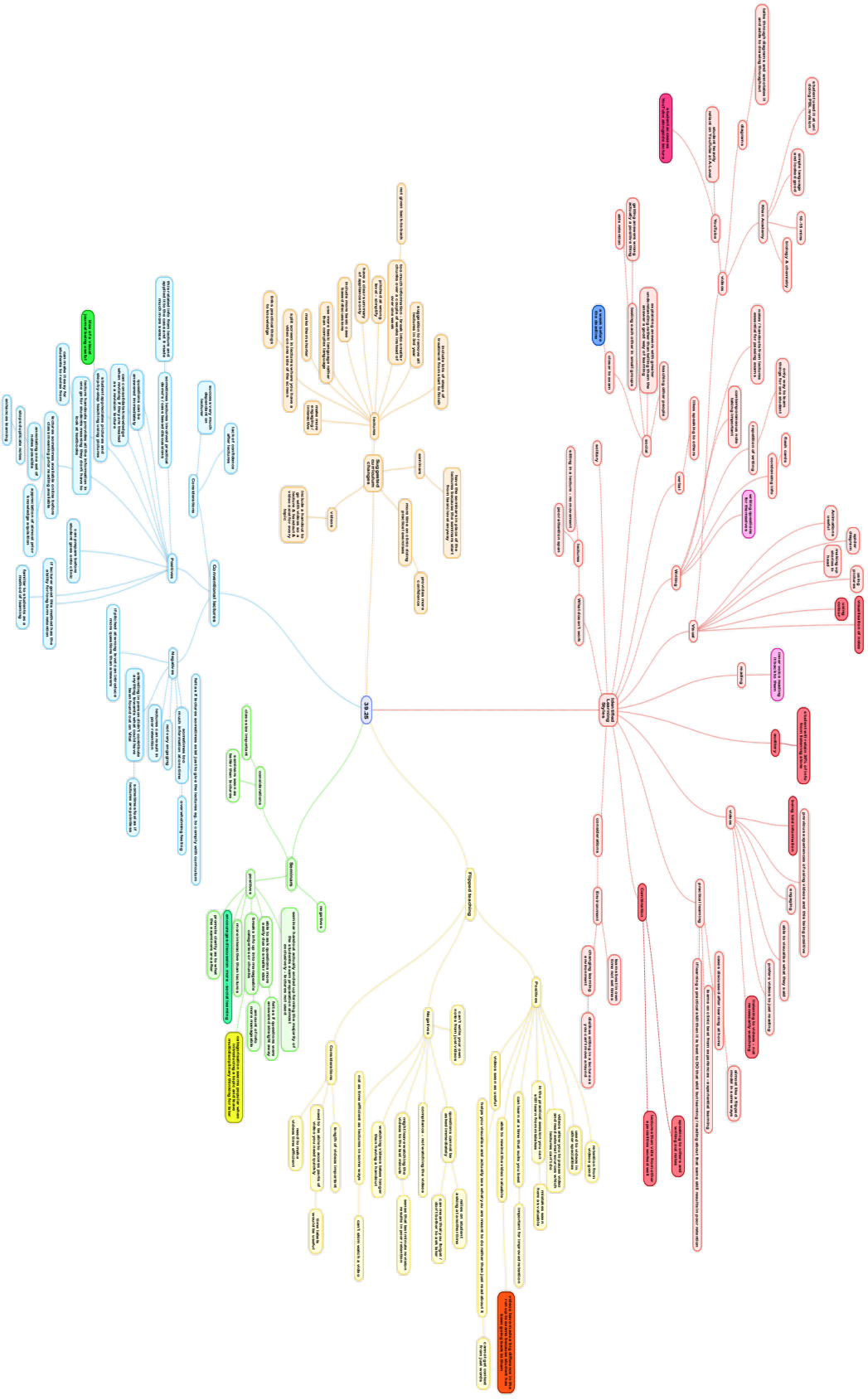
- Signature of Researcher /person taking the consent
  _____

- Date _____

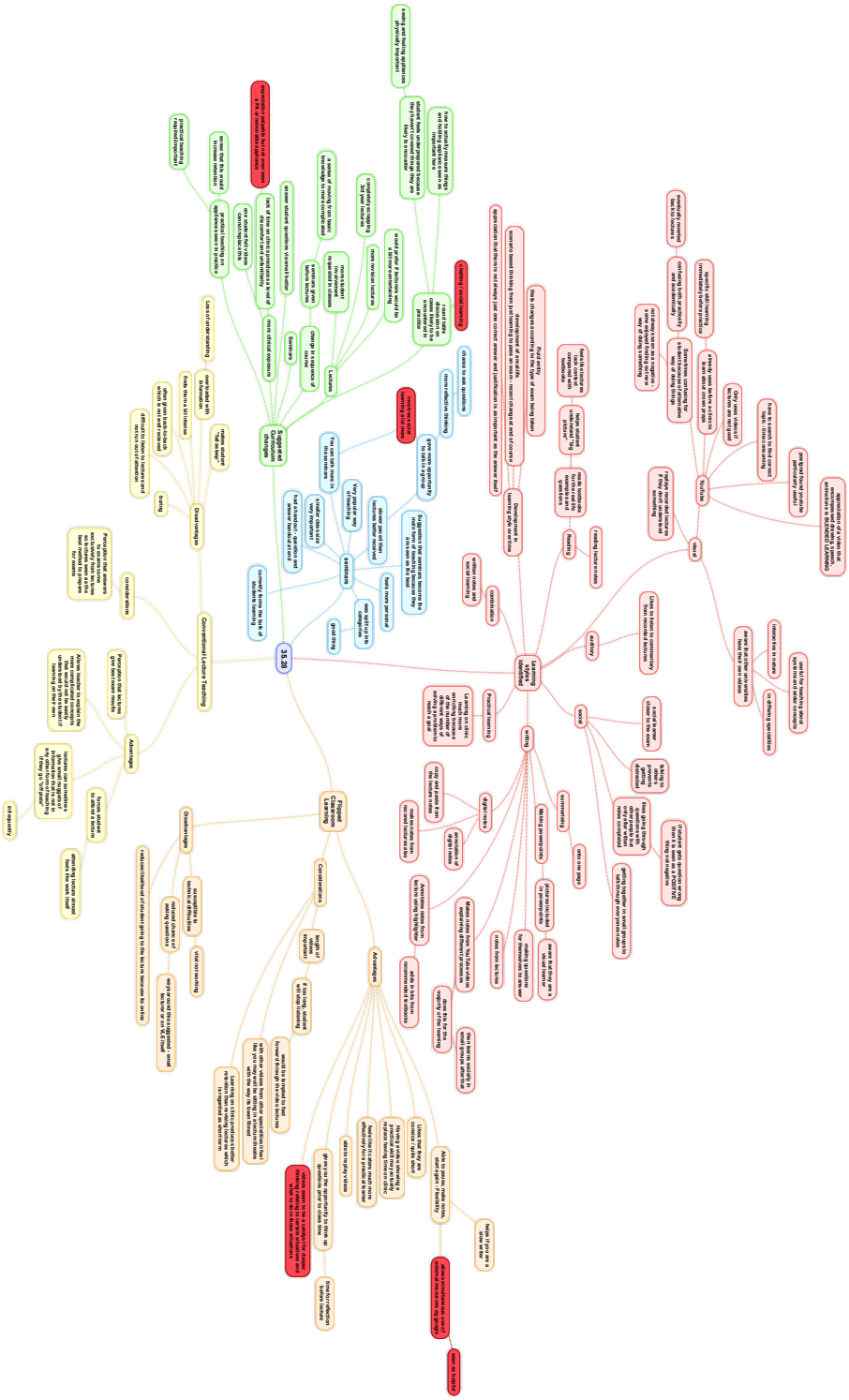
Appendix 2: OSOP 1



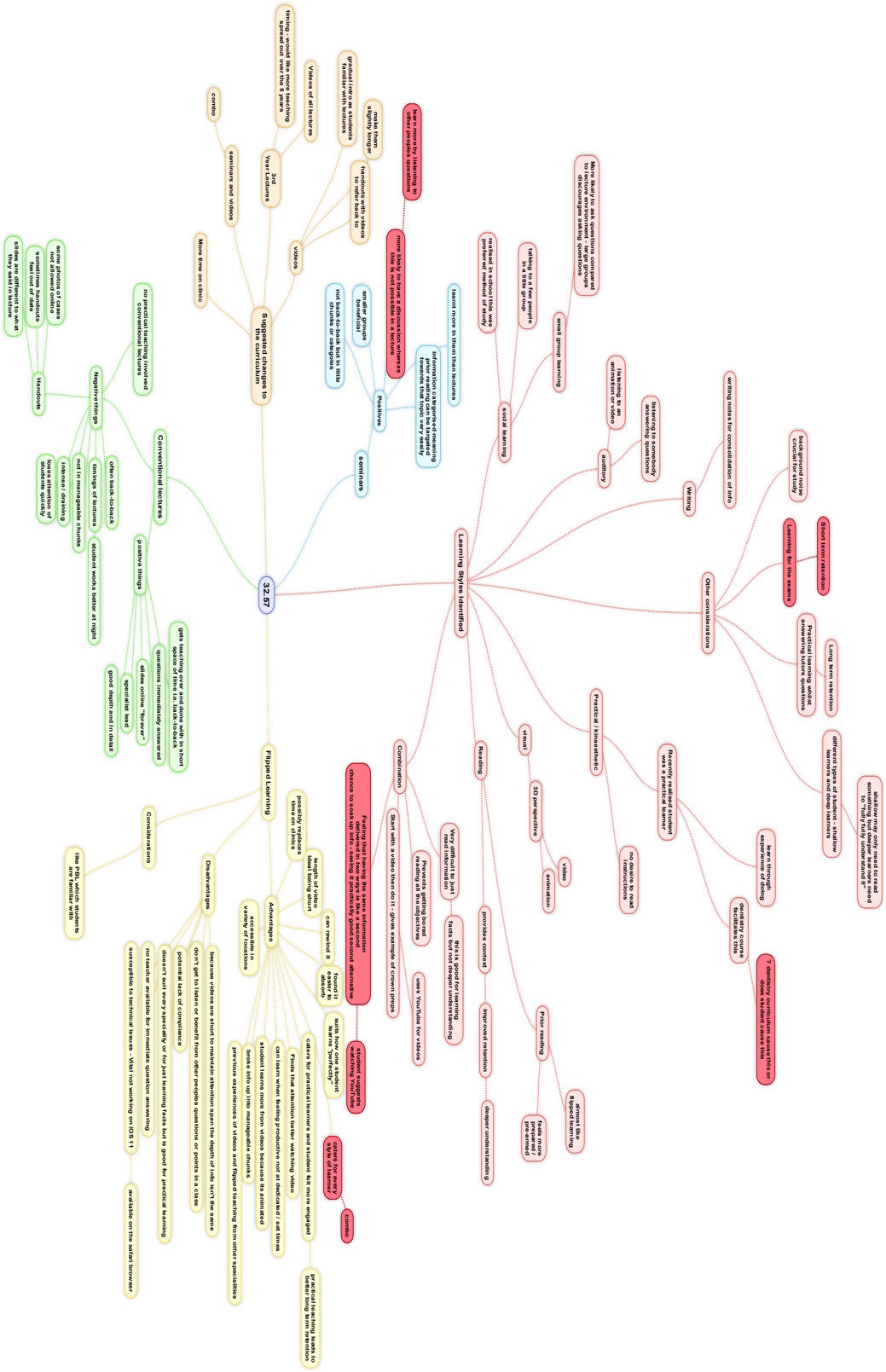
Appendix 3: OSOP 2



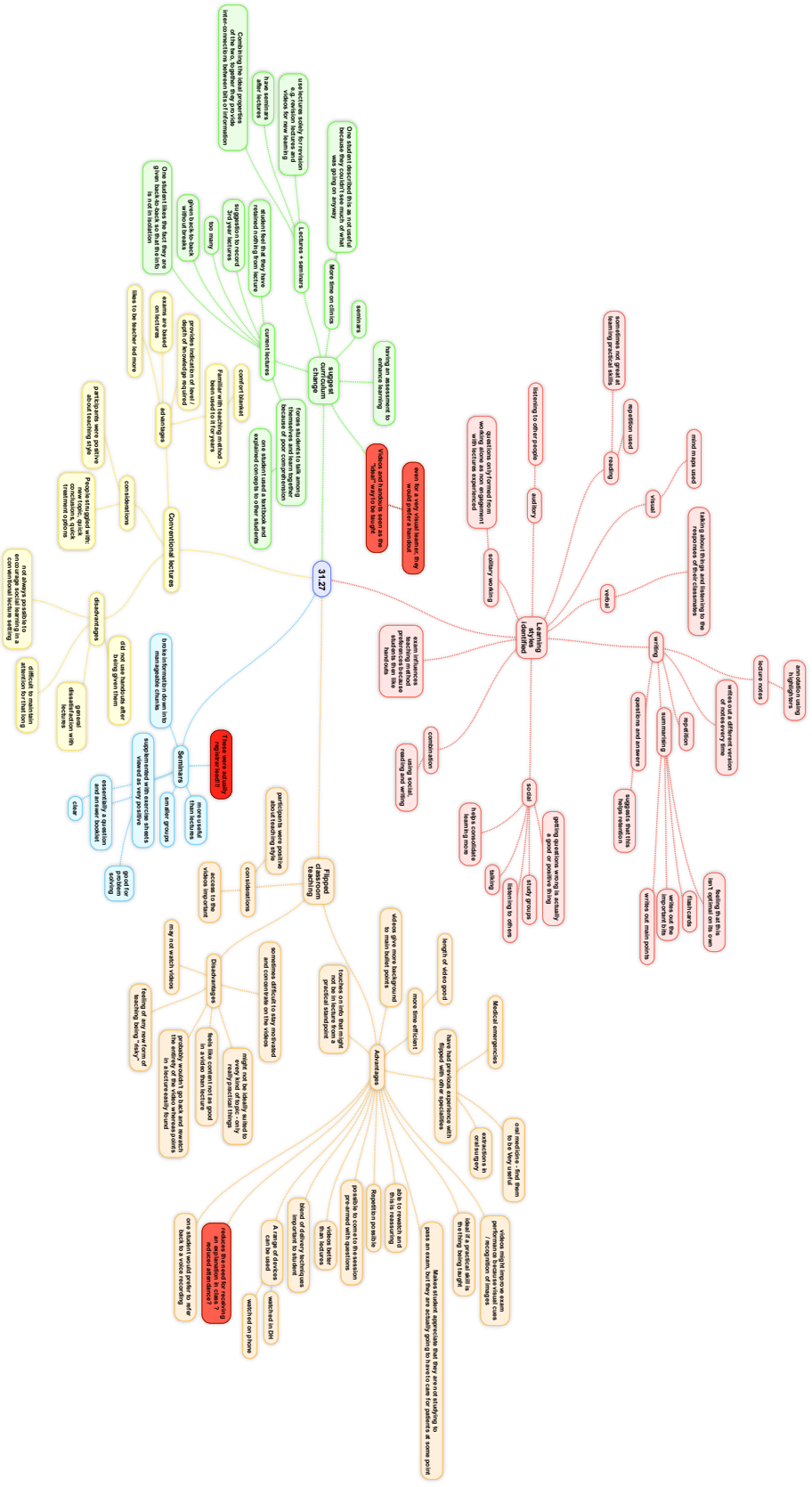
Appendix 4: OSOP 3



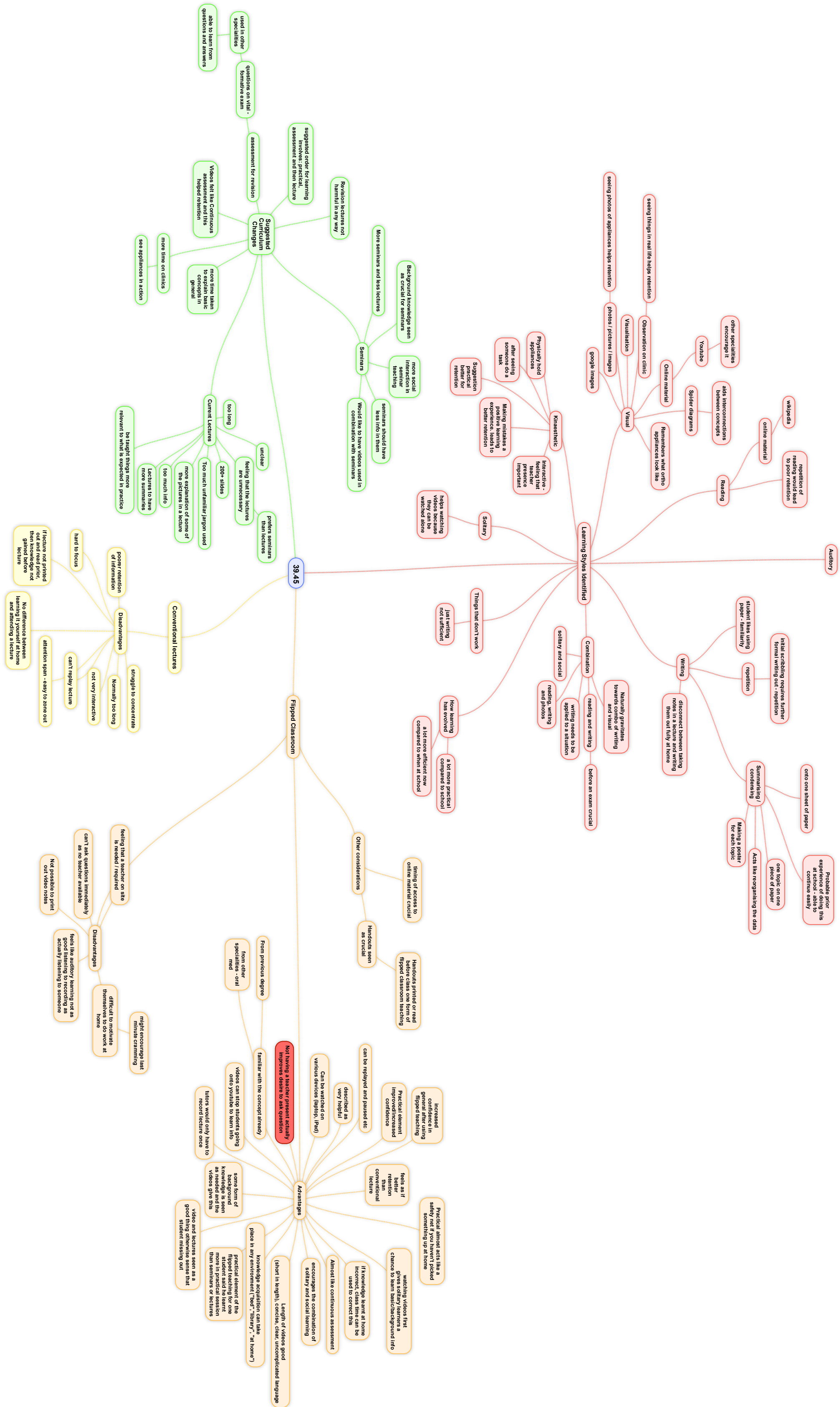
Appendix 5: OSOP 4



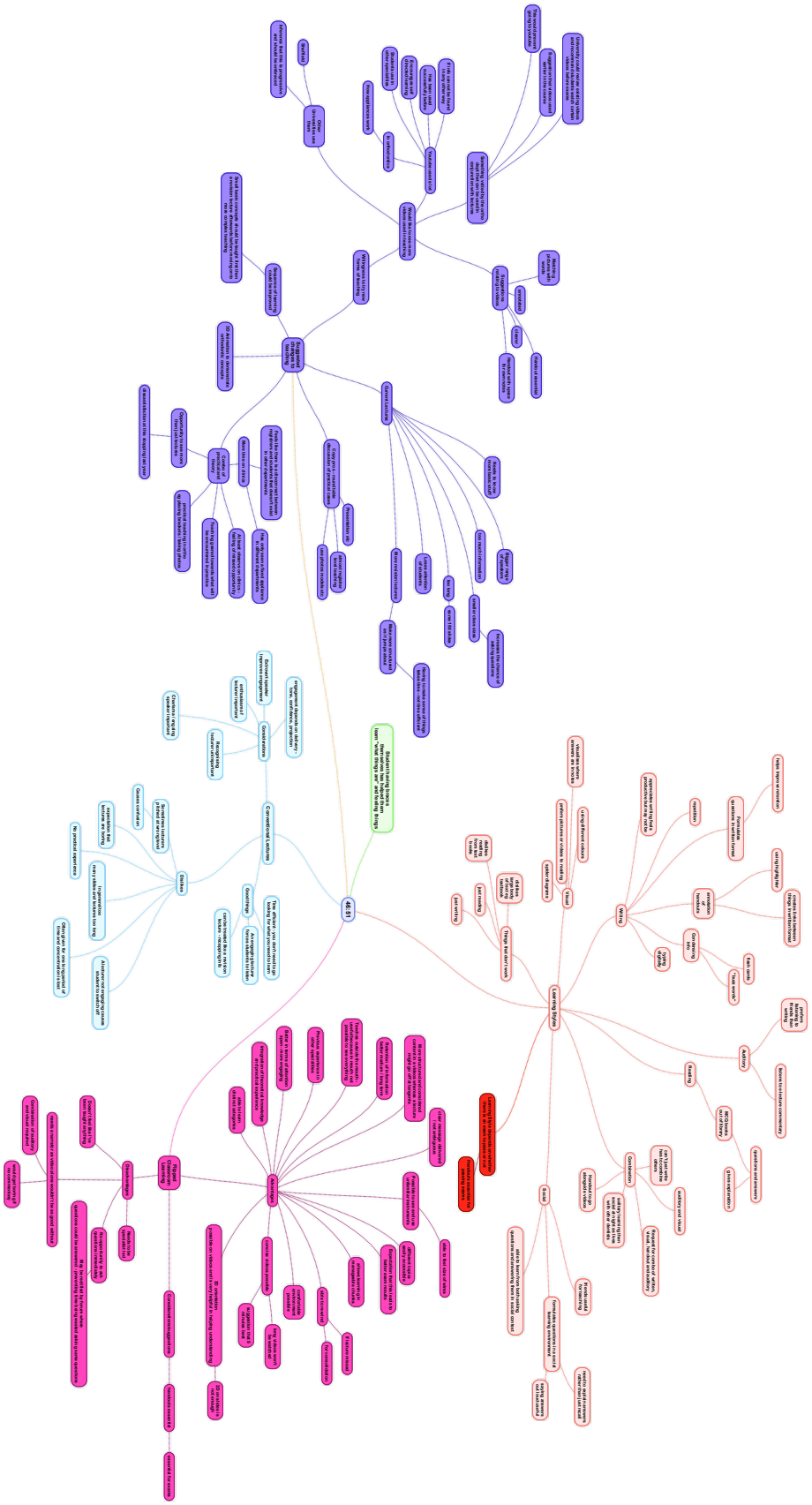
Appendix 6: OSOP 5



Appendix 7: OSOP 6



Appendix 8: OSOP 7



Appendix 9: Topic Guide

Introduction

1. Introduction & Confidentiality
2. Ideal scenario is conversation among everyone within the group with everyone contributing
3. Go around room asking for names and Undergrad/Postgrad.

Personal Learning Styles

1. So first of all I'd like to start by saying that when I was a final year dentist, I was just starting to figure out how I learn best. It took me a long time to even think about learning as a concept. I just want to start by going around the room and inviting each of you to talk about how *you* learn best
2. When was the first time you thought about how you learn new information best?
3. Does anyone know of any learning styles, theories or principles?

Learning at University

1. How has the way that you study or "learn" changed throughout your time at university? Interesting study techniques?

Flipped Teaching

1. So the Flipped Classroom style of teaching is where knowledge acquisition is done outside the classroom and students use time inside the classroom for problem solving or in our case, using instruments. Has anyone had any previous exposure to this form of teaching previously? Using videos and not lectures?
2. What was good about it? any advantages?
    a. Flexible, convenient, self-paced – time, interactive, provides clarification, allows students to arrive to class better prepared, Real life examples, Rouses interest, Learning style – PBL, Effort
3. What did you not like about it? Any disadvantages?
    a. Engagement from leader
    b. Reduced contact with teacher
    c. Reduced opportunity to ask questions to leader
4. Where did you view the videos? Or in other words, where did the knowledge acquisition take place for you? What time?
5. What did we use to watch the videos? Did you use your Phone? Computer? iPad?
6. Did you find that they were good for your learning style?

Conventional Teaching

1. What do we like about traditional lectures?
    a. Content from trusted source - teacher
    b. Spoon fed
2. What do we dislike about them?
3. What learning styles
4. Is the setting of lectures ideal for learning about dentistry?

Flipped Versus Conventional

1. Using a show of hands – did we prefer the idea of using Flipped Classroom Teaching or the Conventional Lectures?
    a. Group 1 –
    b. Group 2 –
    c. Group 3 –
    d. Group 4 –

e. Group 5 –
f. Group 6 –
g. Group 7 –
h. Group 8 –

2. Which method of teaching do you think obtained the best exam results?
3. Enjoyment
4. Attendance at exam

Closing

1. Closing statement from each member of group
2. Thank each member of the group for their willingness to participate
3. Reiterate that their comments will remain confidential
4. Sign attendance register
5. Food

Appendix 10: Verbatim Transcription From Focus Group 1

The first thing is I am going to be recording this ok on here, so I don't want anyone to use any names of anyone, erm the reason is its going to typed up because obviously we cant obviously remember the issues from 8 different groups of 9 people or whatever it is. Erm so my name is Grant and I am one of the registrars in orthodontics erm I've said anything you say is confidential, you can slag off this course to the end of the earth and I do not care because I didn't put it together, I didn't write any of the stuff, I don't mind, nobody's ever going to know erm what we will do though is we take all you suggestions on board and try and change things and erm we've had 3 groups this morning, they weirdly enough nearly all said the same thing erm and so there is a pattern emerging ok so it will be interesting to see what you guys think.
The idea is that this is a group, this is called a focus group so we don't want me just talking at you, I want you guys to talk amongst each other so it will go forward in all directions. Erm I don't know anyone here so I don't know any of your names and for the sake of confidentiality I am not going to ask you your names either. So what I do want to know is anyone a postgraduate here?
No? no? ok.
So can you go around and just let me know first of all what you think your learning style is. We'll start in this direction if that's ok?
So let me just give a little bit of background first of all. When I was at your stage, I didn't have a clue how I learnt best and it struck me when I left that I went through school and got myself to uni and then got myself through all these exams that you guys have just done and I don't really know how best I learnt, so I just used to write things down and then write things down again and copy it again and just hope that something would sink in and then I realised that that is not the best way to do things, so have you thought about the way that you learn best? And also do you know of any sort of theories, principles, erm or erm any sort of techniques for learning and how that fits in with you? Can we start with you?

Erm so I feel like when I revise like when I learn things it is most efficient when I can actually have someone tell me, so sometimes I used to watch lectures online, I found that a lot more engaging and I would just listen to that and makes not from that and then I can remember things they said rather than just sort of reading from a text book, so that's how I kinda like how I like to revise generally. And so especially like for dentistry, stuff that I would learn on clinic from situations and hearing it from a tutor and then that will stick in my mind a lot more than lectures.

Ok so is that actually the tutor telling you or is it you actually doing that thing? Do you see what I mean because there is a difference. So the guy telling you is auditory learning, whereas you actually doing it and learning from your mistakes is something a little bit different.

I think it would be more being told.

Ok ok ok That's interesting, ok. That's cool. thank you.

I like to learn doing a bit of everything, so like moving about when I'm working I cant just sit in a lecture and learn really, reading things out to myself and the way I remember it is like visualising something I have read and then eh hearing it back in my head as well so it's a bit of everything really but traditionally sitting in lectures that really doesn't work for me.

I turn off quickly from a lecture.

Yeh I'm the same.

Depends whether the lecturing is engaging or not.

Yeh yeh absolutely. I'll come back that actually. How about yourself?

The same, in lectures I'll write notes but I'll only take in probably about 30% of what's being said and I like reading and like listening to videos , having my own time to take in information and then I like speaking as well, like teaching other people, I think sometimes that reinforces it coz when someone asks you a question you have to think about you know more details to kinda to answer.

Yeh yeh ok. So do you live with anyone at home that you do that to?

Yeh

Ok ok and that helps you around exam time. But also a bit of writing and words

Yeh that combination of things.

That good ok that's great thank you.

I'm a combination as well but I like doing colourful notes, like pictures, I like having something that I can make into, say oral medicine, having the picture and something that will trigger my memory of it and then once I feel like I have done really colourful notes as well so that I can remember seeing the name in different colours and things like that and then it will be testing each other, so like I'll work in a small group of people and will just randomly ask questions and I feel like if I get it wrong then I remember it more.

Ok yes ok yeh, that's quite interesting so I see what you mean about a blend there so writing, highlighting so there is colour, there is visual stuff, there is social interaction maybe with other people and questioning an then you are first person to bring up getting it wrong is probably a positive thing

That really makes it stick with me.

Yeh. Ok. How about yourself?

Erm yeh I like to visualise things like with colour as well, making up like stories in my head with certain information. Erm also like asking myself questions, so like I'd write down like a question in my notes so that will trigger like remembering the information and like with a group of people it helps as well to remember stuff.

So slightly different, its not necessarily thinking I have got this one lecture on a page and I am going to try and visualise that page and just regurgitate it, its actually sort of taking the words in a bit more is that what you mean?

Yeh I write myself questions and then just read the question and then try and think of the information

Its like testing yourself?

Yeh

Ok ok cool. I like that. I do that too. How about yourself?

Erm I like to start with a big set of notes and the I will write a smaller set from that and I'll just keep going until I basically end up with like a set of flash cards, so I probably write the same stuff out like a bizzillion times but it's the only way I remember it. And then if I know I have got an exam or something, then closer to the time I like to work in a group but generally I'm independent, so I would start working in a group until a week before a deadline.

A lot of people have said the same thing, its almost like you are writing of your lecture and then you are writing summary of the summary, condensing it down literally until its on a card?

I just have to trick myself into thinking there is not as much to remember I suppose.

Yeh yeh yeh ok perfect, we'll come back to some of those points as well. Lastly,

Depends on what it is, so we had a set of oral med things that we had last year where we got lectures we needed to watch online before going into things where cases then discussed about patients, so you then got the practical application so it was quite good to do that at home first and then have a tutor there in front of you and talk about how you would apply those to patients. Erm If it is a lecture I need to learn, I need to write notes up that night, that then sticks in and similarly, I've got sets of notes and then smaller sets of notes that will be spider diagram.

Ok goodness yeh

If its something practical, then learning and reading so say endo that just doesn't go in until I actually do it, so yeh it completely depends.

Yeh it depends on the thing you are doing. Ok yeh that's interesting. So overall opinions of that? Well not opinions but erm observations I think, we've only got learner here who thinks that they are a practical learner almost from what you were saying, getting told and getting shown how to do something erm I can see that a lot of you here unlike some of the other groups, are blended learners to erm you're a combination which is normal, so you might do a bit of visual, writing, erm trying to talk to people which is quite important.
Erm what I want to talk about now is the flipped classroom idea ok? so erm where the knowledge acquisition is as you know is done away from the classroom in your own time at a convenient time and place, erm and then you come in and rather than the time being spent acquiring the knowledge, its spent problem solving so another sort of discipline like engineering might I don't know think about ways around a problem and come up with different ideas, we cant really do that, so instead what we tend to do in orthodontics is just hold the forceps, have a look at the different materials and all that kind of stuff. Did anyone particularly enjoy that? What were the things that they liked about it first of all, lets have a positive spin on it first of all, maybe we can just go around the room. Anyone?

When we have used the end cutter and you are like oh it'll hold it in and start, I did it and it was wrong and it flipped out, so now I know.

Ok so it kinda goes back to the getting it wrong thing you'll probably not do that again.

So now I wont forget how to use and end cutter, whereas if I'd got it right, I probably would have been like oh it was something like this.

Just kinda do it like that and hope for the best, ok yes that's quite interesting. Lets talk about the videos first of all then, was there anything about the videos that you liked? Other than the things I have said now?

What would be good about it is that you could back to it, if you are like doing the course and then finish the course and afterwards when you are revising, you can go back to it, that would be the best thing about videos.

Absolutely yeh.

You can time it to when you like to work best. So that if you don't work very well in the morning, you can do it when you feel you can take it in.

That's a popular one this morning at 9am! That's what a lot of people said. Yep.

You don't always get things the first time round like somethings that practical, I know I don't, so being able to watch something back just gives me more time to take it in rather than being expected to get it right like straightaway.

First time yeh. Ok. Anything else? What else did we like about them? Is that kinda it?

Just being able to see it.

Just being able to see it yeh?

Rather than words on a page just being able to visualise.

Ok yeh. Goes back to that practical experience doesn't it, so erm I think we are always conscious of the fact that you guys don't get a lot of time on clinic if any, and so actually seeing things in orthodontics or like in oral med, one of you was talking about oral med there, it is very much a visual thing and you really see a white patch you kinda know what to do, if you see something in ortho you can know what to do and erm erm having a video kind of makes up for the fact that you have not got a lot of time on clinic so yeah its almost linked into that isn't it.

Did anyone watch these videos on anything other than their laptops?
No? no? ok.

What would be the negatives? What didn't we like about these videos? It important you are honest here. Anyone?

Just you can't ask questions at the time but you can kinda save them and ask them when you have like a tutorial.

Ok yeah yeah

Its just that risk of potentially forgetting to ask and you leave and it a missed opportunity potentially.

Ok. How about do you think everyone will have a look at them before coming in? do you think? You think so? No? Come on then, you don't think so?

To be honest I forgot to watch the videos!

Ok yes that's fine ok.

So that would be a problem for me because I would just leave it to the very last minute and then just sort of hope that on the day I will just get the information.

If you asked me to go and watch the videos at home, I am not sure I'd do it so I'm glad you said that Anything else?

I sometimes also think watching videos takes a lot longer than reading lecture slides, so that's another thing that would go back to sort of if I had to prepare for a session, I am more likely to glance at lecture slides as that's a lot quicker to read than to have to, whereas a video you cant really fast-forward it, well you can, but you will miss everything. You cant skim watch a video.

But then the opposite as well, because if something occurs to you you can pause it and do a bit extra reading at that point before carrying on, whereas if it a lecture you might forget to do that.

If the video was like, and I opened it and it was 40 minutes, I'd think twice about doing it, but if it was short, say 10 minutes, then I would do it, so the length of time probably depends

I think it would help if there was a little key on there that told you at what time in the video certain points were coming up about certain aspects of the treatment, coz if you are troubled by something you can just skip straight to that specific moment.

Yeh ok that's a good idea, I'd not thought about that. Ok. Anything else, things you didn't like about the videos? That's a good suggestion. No?
its ok if you don't, there is no right or wrong.

Lets talk then about the normal lectures. Now you guys have had lectures in here for years, erm and you are coming to the end of that now, erm does any one particularly enjoy the lectures over the videos? Does anyone feel there are advantages that normal lectures have over videos and practical assessment?

For ortho I quite liked having the seminar sessions instead of the lectures we had the year before. The lectures we had the year before we all like, I think we had 6 hours of lectures or something crazy, all in one day and it just got very boring towards the end.

It was too much information to take in as well, you just do get a bit overwhelmed by it. With the seminars they break it down for you and you can ask questions a little bit easier as well.

We were in smaller groups so it was more interactive if you wanted to say anything.

As you said smaller groups are more interactive, is there anything else that helps with that ?

Not one on one, but because there was so fewer people, any concerns that we had were addressed straightaway and also because it was all split into like a topic at a

time, you weren't like bombarded with information. I thought that after the 3rd year lectures, I was basically like I just don't know anything to do with ortho, it was only when we had the seminars that I actually understood what they wanted, so I just thought 3rd year wasn't, like it didn't have any meaning.

Yeh I feel like the lectures were only for the sake of just giving us the lectures, like they could have just put it on Vital and then it would have been fine. I don't think it was necessary to just like tell us all the information we could have just read it.

Ok yeh, 6 hours. With a break for lunch was it? I would have left! haha

There was the practical aspect at the end of that week in 3rd year where we were involved in cases, there had been so much information and it just made no sense even trying to apply it, it was so difficult.

You see I liked the practical bit coz then we just ended up asking questions at the time, so like for this case would it be this this and this and then we ended up getting taught it on a smaller scale and that was actually the best part of the week.

It was, but that was the thing it was so many questions, coz you just see with me I just go the practical bit and I was completely baffled.

My group didn't really know, like literally nothing, no one knew what was going on in the practical, we were all just confused like.

Its because there were so many new terms no one knew, I just remember like new words, no one knew what they meant.

It is interesting that you have said that erm again that sort of matches with what you are saying because you're practical learner but also this morning every group said exactly what you have said, almost word for word. Erm we'll think about making some changes which we'll probably come back to at the end. Erm so more likely to ask questions erm, smaller, probably categorised as well maybe into like Class I, Class II div 1, II/2 and stuff like that, erm probably helps your learning and might help you guys there that want to imagine sort of visualise pages or presentations or something, that would probably help you too, so that's something interesting we will come back to. So that was just about everything under the sun about what was bad about the conventional teaching. Was there anything good about it at all, we missed that, I asked if there was anything good and we all jumped into what was bad about it! Erm anything good about it at all? Advantages of it? Does anyone particularly like it?

Advantages of having lectures?

Yeh yeh. Beacause theres hundreds of them

There are lectures we have had in 5th year which have been really useful, a summary of things and paeds and ortho together at the start of the year.

Coz they go hand in hand don't they?

Yes.

Was that useful having both those things and seeing the crossover? Yeh ok yeh.

I am sure now if I looked at the 3rd year lectures we had, it would probably make a lot more sense to me and I would probably actually appreciate the effort that has gone into those lectures.

I like it when lectures like sort of have a step by step picture guides, I always find that useful, so it like before someone's showing you like to hold the instrument or whatever or like how to cement back on something or other, because it is showing in you stages, that's always useful because then you can go back over it if the lectures get put up onto like Vital, but that is always helpful with lectures you can sort of see it without having to actually do it, but I think its better probably to do it, but that's a second best option.

I do just think lectures are massively dependent on the lecturer. So some of them are really good and I will still remember lectures from like years ago, they have just stuck in my mind but then some of them like I forget even being there. So it just depends on that. but it is also really good that we get all the information on the slides that we can look at afterwards so its just sort of a good way of having the information there as we don't really have a text book or anything, so its nice to be given it so we can read it again in our own time.

Ok ok so what you mean about text books. Erm

That's one thing the lectures from the ortho department have been online before the lectures which to me is really important to be able to have a glance before the lecture so I know whats coming up and having it there during the lecture because if you are trying to make notes on something separate and then trying to put it back together afterwards.

So yeh yeh, do you have a look at those notes before you go into class?

Depends on what it is. Sometimes you do

That's almost like a sort of your having a look at something and you're almost doing a little bit of knowledge acquisition before

Because I know that's how I learn, so like with the oral med thing, where you do the lectures and then the practical, it's the same sort of thing.

Does anyone else to that? I never used to do that. I was one of the people that wished I did.

I'd never do that, I'd never have the time to do that.

Ok, erm just for your information I suppose, the conventional lectures are nearly always taken by a specialist in the subject so you can kinda trust what they are telling you is sound, erm other things about conventional lecture, they are nearly always have aims and objectives so erm you can follow, you know what you need to learn, erm you can make questions from that, you guys that like to write questions for yourselves and ask your friends, erm that can be done that way. Erm There's lots of little things that like that, exams can be made easily and things like that. Downsides are that I suppose you need to turn but at the time, its about time. Once its gone its gone you cant get that back. Also a lot of people don't feel confident enough to ask questions like you said there about asking questions in a smaller group and that was something that came up again and again this morning.

Erm I want to take a short break then and just ask you to put your hand up for whether you would prefer videos, conventional lectures first of all, so if we can have a show of hands first of all. So flip teaching or conventional? Which one suits your learning style best?

- *so if we could have conventional first of all. Anyone prefer that kinda teaching? Yep. Anyone else? So that's 1,2,3,4,5,6*
- *to 1. You're completely the opposite from the other groups.*
- *If you feel you had the opportunities to have both, by both what I mean is have videos and come in to do practical stuff and then also get given a handout, so something that you can print off, er you might be able to look at before you come in and as you are doing practical or watching the videos even, in your own time at home, you can also make your own notes of it. Does that seem?*
- *You are all nodding in agreement there. That was something that was suggested by each of the 3 groups earlier this morning.*

Ok what method do you think made the best exam results? So pretty much you have all told me that that's what you prefer, so from a satisfaction point of view, you seem to like a blended learning approach rather than just a bog standard you only get conventional teaching. In terms of what is more effective when it come to exams, how do you feel about that?

I think the conventional would be more useful just cause that's what we are used to and exams aren't practical really, so you would read the lecture and you would answer a question and its all written anyway, so I think for exams it would be like that.

Ok does anyone disagree with that?

I think everything I have known for the exams I think I have just taken from the seminars that we had, coz like they had the handouts and stuff so I annotated them as the lecturer was talking to us and going for it and I just learnt from them. I didn't really use anything else.

So this seminar is about an hour long each are they? And if there is maybe one on Class I, Class II, Class II II, Class III that's like 4 booklets covering almost everything you need to know along with maybe a bit of Ceph and other stuff. 7 things was it? sorry I didn't know. So does everyone tend to use those things? Is that something you think everyone just looks at these 7 booklet and thinks that's my ortho training right there?

Yeah

Yeah

Yeh pretty much, there's nothing wrong with that, that's exactly what I would do. Ok fine. Interesting what you said there about passing an exam because again other groups were keen to point out that's nots what's going to happen in 3 months' time, so you would be in a situation with text books going through the window in some sort of situations and also, erm some people might argue that in order to answer the question properly, you kinda need to imagine yourselves in that situation, doing that thing, so if someone said to me someone collapses what are you going to do, well I don't now think to myself I would, what's the exam answer, let me visualise that

page, let me now think about my spider diagram, I actually just think well I'm going to just look around first to see if there is any danger and see who is in the room to help me and that's maybe another side to that.
Erm we are almost done. You have brought up the seminars, we have brought up time and how videos sort of almost replace time on clinic, erm these lectures in 3rd year seem to be a problem. So do we think these lectures, the big block, and there is a good reason why they are put in a big block on a full day with hours of just slides, do you think they should be got rid of? Or do we think they should just be put off til later?

Just broken up a bit, it was the volumes in a short space of time on a brand new topic and something that was so different from what we had done. I think just over a couple of weeks, so if there had been a couple the week before even, something as simple as that would have made a big difference.

Ok anything else?

That's exactly what I thought, just time to digest the information between each lecture.

So a lecture was like 9-10, 10-11?

Yeh it was just too long.

There was nothing wrong with the content from what I remember, it was just boring.

Its useful to be able to have them all so you can just go over them and look back but you definitely needed to go over them again, it wasn't just like a, you couldn't just maybe like sit through one lecture and feel like I'm confident with that, its all like relatively, it was a lot of stuff we just had to read over several times to me any way.

We mentioned oral medicine there, oral medicine do a similar sort of thing?

So like once a week in 4th year you'd have a seminar it would be like a big lecture for is it 2 hours? Something like that in the morning.

It was just a couple of topics, they gave us stuff to watch online and then made cases when we went in, most of it was just normal teaching, I don't know if its still the same now

So a good thing? Yeh? Not so sure?

It is more spread out but it was still like a full morning and then after like an hour you'd switch off , that's for me.

Ok. The fact that you were doing cases must help you, something for the practical learner who liked to get involved that way. Erm what else would I like to talk about really? that's pretty much it. I want to go around the room, I think we'll go this way. What I would like to know is, finishing off with just a brief summary of how you found it, so how you found the videos, erm good things about it and bad things, what you would change, what you would change about the course, literally anything at all. So anything new you want to add in now is your chance.

I only had the lecture coz I couldn't make it to the previous week and have not had a chance to watch the videos, yeh 4th and 5th year I wouldn't really change in terms of ortho, just 3rd year erm as we have already said, is there anything else?

Erm Videos, yes or no?

Yeh.

Ok, ok if it was done properly and right

Again its hard to go back to coz we have got random bits of things with bits of topics throughout the whole course where you can go back and watch videos that for some reason was decided to put those ones on line, so I know over the last few weeks I have been watching bits of them and it has made a big difference now in the line up to revision having them there.

And what subject is that? ortho?

No it was a couple of oral med ones that I found.

Ok.

I'd agree on keeping the videos, I think they are useful. In terms of what I would change, if it was me I don't think I would have any of the lectures in 3rd year just from my experience I would benefit if you are going to have the seminars in 4th year I don't think there is really any need for the lectures because you can go in as a fresh slate and it starts from the beginning anyway. With treatment planning and ceph and everything so I just think it would be better to do it that way.

Ok fair enough that's great thank you.

In terms of the videos, I didn't have a chance to watch them but I would yeh I would prefer having them so you can have them and if you want to you can go back. There was some oral surgery videos for extractions and I found really useful and because it is practical and obviously when you go on clinic, its practical as well that was really useful. I feel like I learnt a lot from that and then in terms of teaching, I feel like the 3rd year lectures if they weren't there, it wouldn't have made a difference because its just yeh I didn't take anything in. May be they just put them in there so they can ask us ortho questions in like the 3rd year exam!!! (Laughter)

I'll talk to you about that at the end if you want.

I like the idea of having like a lecture print out with videos as well as the idea of maybe watching it beforehand and then having the lecture like to sort of assist you as well, but I think like there is an element of being able to do like little bits of practical stuff does help to settle it in your head almost, I do like, as mentioned before, like if you do like root canal and stuff you do find like the stages sort of sit in your head a little bit better, so it is useful being able to watch the videos and see it as well as like actually having lectures to sort of show you as well. Erm I do find though that seminars are the most useful instead of having big lectures with everybody there having it broken down into like little sessions, it makes me focus a bit more as well coz you cant get away with just sat there on your phone or whatever so, not that I do that! honestly.

So not getting any time on clinic, did you find that the practical session actually like using instruments interesting.

That would be useful.

Yeh yeh we touched on that before didn't we.

Yeh for like me personally that is useful.

Yeh thank you.

Very much the same, yeh I really liked your videos. In an ideal world probably I'd like both the lectures and the videos, just after having the lecture it would be good to go back to the videos. The biggest problem I had with ortho is appliances, I feel like not being able to see them, is one thing that I hated, that I had to find pictures myself of every appliance and make my own little chart of something. And functions, like what they do. So that would nice to kinda have an appliance sheet or something that you can look back on.

Ok yeh. There hundreds of them. We can talk about that but just finally just before we break off.

Pretty much similar things as well, the lecture complete with a video would be really good like even if they could do split screen on the lecture board where they go through information and the video assists it. I like the practical side of it as well. It helps me learn a lot too. But the conventional lecture like in 3rd year just don't work for me.

The split screen thing is that something that was done in other specialities?

No its something that I kinda just do at home, you have You Tube up along with a lecture or something just to go through it yourself.

Hold that You Tube thought. Last but not least.

I do think the videos are really good but I am just a little bit concerned that er I would have to write out my own notes from videos, I would like a bunch of slides too, so I can have written materials to for revision.

You like to be taught don't you so almost being spoon fed, it keeps you on the straight and narrow doesn't it. So we mentioned YouTube there, one final thing. I think that You Tube is fantastic, the thing is with You Tube I think it needs to be almost policed in some way. You don't know what you are watching is right. It could be fantastic, it could be completely wrong. Erm other groups have suggested a You Tube style sort of series of lectures where almost every lecture is put into a sort of You Tube type style of video and other people have said that they actually disregard the notes and go straight onto You Tube and do it that way and they find that's a lot easier that way and then they come back to the notes. So I thought that was quite interesting. Has anyone ever looked at You Tube for other things?

Yeh when I was in A levels I relied on it loads so there was this account called Khan Academy and there videos are really nice and it was great for biology and chemistry and they were about 10-15 minutes and really like look at it its really pretty! It is really really good and the way they said it is really sort of, I really thought that was very useful.

I used it a lot when we did like PBL stuff and anatomy, there is one account that he draws a diagram and you print it out and then he talks you through, so it could be a flow chart, it could be like part of the anatomy and he just gives you options to annotate the diagram that he has already drawn for you and he finishes drawing it by the end of the lecture which I really good.

I can't remember what it's called.

That's how I learnt anatomy, in PBL because I couldn't read Totor2u is something.

Ok ok. Any more You Tube things before we close?

I still use it for like handouts and stuff.

I have found a few oral med ones that are good. It's got its own animation that makes it, like facial swelling and then like little things will pop out and then it's like you have a little diagram of an egg shell cracking, you have little things about, I just love drawings and stuff! Colours and pictures!

It all helps! Right that's great I'm going to stop there. Thank you for coming along. Thank you for your willingness to participate. It is going to be confidential. What else do I need to say? Sign the register if you have not already and there is some more food if you want some, if you don't way any, don't feel like you have to stay. There is pizza here. The next group is coming in in 10-15 minutes.

Appendix 11: Verbatim Transcription From Focus Group 2

So you have seen me before so erm I am one of the registrars here erm and this er type of environment is called a focus group, so the idea is that it is not me leading it I want everyone to chip in and I will going around and I want to sort of interact in amongst each of you with all the questions and then the idea is that we finish off and by that time, hopefully quite quickly because we are going for tea, we have got a better understanding of what you think about the orthodontic teaching in general, ok? So I don't know your names so can I go around, you obviously know everyones names but I don't know any of your names, sorry!
Ok Ok
So first of all, I suppose when I was a final year dentist and I was just about to graduate, I felt I was just getting the hang of how I learn best and I thought it was quite interesting when I was leaving there because it took me years to figure it out and then I was leaving. So can we go around the room, why don't we start here again, and I just want to have..
Ok, don't worry have a seat. What's your name?

Val

I just want to go around the room and maybe you can tell us about how you think you learn best, just briefly.

Erm I think learn best like making my own notes.

Ok yeh.

Erm, I think I learn by writing my own notes. Erm just reading through them and writing them back out again, so it makes it stay in my mind and then erm I think little study groups listening to each others them explaining something that helps it stick in my mind.

Ok

And the lectures we have.

So do you write things out time after time after time?

Yeh I keep doing the same things every year, I just don't go back to the same notes and look them again

Ok that's interesting.

I make some new ones.

Ok ok. And then you spoke about talking to other people and bouncing off them almost, does that form the majority of your learning or is it..

Er it just like consolidates it more, like after I have done all the notes and reading and its kinda already in my mind just going over it and listening to other people and I think I'm a bit audio as well.

Ok that's quite interesting.

I would just go through the lectures, I'll probably write out most of the lecture and then write out a crib sheet for each thing, just the main points I think are relevant and to make sure that I have learnt it, I use online flashcards.

Do you? ok, interesting.

I just go through the first sheet of what I have learnt.

Ok so quite a lot of written stuff there, almost like making summaries and then making a summary from a summary?

Yeh

Ok ok, yep.

I think writing things out with questions and answers helps me, there are lots of times I think I know something but if I rephrase it I am not quite sure!! That's how I think I learn.

Yep good good.

Generally I just go through the stuff from lectures and then like print stuff and attach them and print it out and then I'll go through it all and highlight what the important bits might be and then once I have got like the complete notes and it is all highlighted I try and make mind maps.

So that's interesting ok, so the first thing a few of you have said like do you find your lectures are any good of those that have answered so far?

Yes, you make notes coz with the ortho a lot are just pictures and so if you look back and look at your notes, you're like what is that.
Yeh yeh
Lots of exam questions are based on lectures and so..
The lecture pictures are online.

That's true, ok.

I'm saying scenario based question answer based but I don't know, I have a different opinion about the lectures like I know most of our exams are directed towards that but they are not all bad

Ok fair enough fine yeh. When I was at uni I felt the same thing so that's fair enough, so you don't tend to use the lectures as much?

Like I use them but, as in its not just like all, until like we had the seminars which were in 4th year?? I think, like up until then I think everything before then is just, as in those resources are just bad for me.

Ok ok

I think in 3rd year we start with nothing and..

but even if I go through those lectures now, its just like nothing, but that's a personal thing not..

That's something we may need to look at.

And not other lectures for.

Ok that's fine. So does that means if you don't think the lectures are so good do you do anything else to supplement that learning, that's what I mean.

Erm, I kinda just learn like the main points that I thought were the main points

Yeh

And just try and just get through with that

Ok fine, the seminars are they good?

Yeh they were good and it was good that they had exercise sheets which were like in a question and answer afterwards coz it just meant that everything you had learnt in the seminar you could actually apply it question answer wise

Good so it's quite well thought out. And was that for orthodontics?

Yep

generally I make notes from lectures and then I print those notes out and go over them and then make a summary of those and I just keep throwing them away and making new ones

Ok yep

And then I like being tested by someone else, so just give them my notes and then make them ask me questions about it and if I get it wrong then I know what to put

Ok good, similar questions and sort of similar to the social sides of things as well. How about yourself?

erm yeh just very similar to what they said, erm but I was just going to say that the seminars were really good because they broke it, everything down into sort of like, in terms of like ortho they broke it down like one seminar to be based on like class iv ortho treatment for class II Div I so like that, so it was all broken down into steps, whereas I think some people struggled with the lectures because you had to have sort of like a long attention span for a brand new topic obviously and I think it was just a bit… conclusion and treatment like for like 2 hours when you're not really exposed to it, is a bit confusing, that's what people struggled with.

Yeh, people struggled with it after 2 years of being exposed to it and to expect to pick it up like that is difficult.

But teaching in seminars was really good coz the lectures were really clear and the explanations were really clear and the groups were much smaller so you could understand them.

So you, did you get them last year then?

Yeh

Yeh and how do you .. we'll maybe talk about the gap between last year and this year and whether that was good or bad thing as well. It is quite interesting that you have said the smaller classroom size has really helped it seems.

Yeh

Ok ok. What about this one?

yeh I'm like the same.

All the answers have been taken!!! Fair enough! What do you think sort of writing, talking??

Yeh I just like to write things, so I have about 50 pages of the like the same notes, I just keep writing them out.

Do you know what? I still do that right now, I really do and I chuck them away and I do new ones and I do that. Does anyone know of any learning styles, theories, principles, something a bit more formal than I write everything out and I talk to my mates? Does anyone have any, is anyone aware of anything like that? Its ok if you are not.

Like audio learning or kinaesthetic doing your stuff?

Yeh yeh

Didn't we used to have like, I mean I am aware but never had it but like they used to have ortho clinics, the year before us used to but we never got any of that.

Ok

We got like I learnt two at the start of it… It was four of you trying to shadow one person, you obviously peered over and so you cant see much what's going on.

It is quite interesting because listening to you all erm it seems to me like the lectures seem and seminars seem to form the majority of what your direction and only one of you has really touched on a sort of a problem based approach to things, almost, so erm I didn't know until I came here that this a problem based learning course and I think it is quite interesting that out of all of us here there is only really one or two of us that have got that kind of mind set and that's because the lectures are crap or whatever so that's quite interesting. Lets talk now about the flip classroom idea. So the flip classroom is where the knowledge acquisition is done at home similar to what you are doing so a problem based type approach and then erm the idea is that you spend the classroom time problem solving, so different, you know if you were an engineer you would come into the classroom and you'd talk about actual practical problems, for us it is just using instruments, erm has anyone had anything like this before? Videos at home that kind of stuff? Anyone seen anything? Done anything? Are there any graduate entrants here? Yeh 1,2,3, 3 so, I'll just write that down actually. Erm anyone done anything like that previously? No?

We have done if for other subjects like medical emergencies and extractions.

Ok is that an OSCE type thing?

Like when we had our medical emergency week, we did a lot of prereading stuff and videos and we watched them before we came in and then we were expected just to brush up

Do you like that idea?

I think it is good if you actually let people watch what they are actually meant to watch.

Ok ok

It's definitely the best approach and the resources are good as well.

Ok do we all agree it is definitely the best approach and the resources need to be good?

I think it worked in that situation because medical emergencies is like a physical thing that you are going to do so it works to watch videos, whereas ortho for example, I don't think that would, well I think it depends what you are doing like the emergency things makes sense but then if somebody was just talking to me about Class II Div I, I don't know if it would be as good for it

Ok that's kind of you'll never be expected to do it for a while and you have never done it before and then having someone almost test you on it is a bit pointless. Yeh ok fair enough. Erm I want to talk about the advantages and disadvantages so what did we like about it? What did we not like about it? So..

Is this ortho emergencies?

Yes more specifically the videos, doing some learning at home before coming in.

I think having access to the videos, in fact we actually had access, like gives you the opportunity to go back if you have tried to learn something and you are not sure, you have reassurance there to..

You can go over it again.

Yeh, ok yeh.

It is good that you would be able to come to the session with questions and would understand that you have watched the videos.

Yeh yeh perfect. So less sort of time is wasted on other things, if you have got it you have got it and you can ask your questions straightaway.

I was going to say I don't about that, but sometimes in a lecture I just sit there and just wait for the talking to stop but I don't actually learn there, so when I am coming to revise that's when I get all my questions.

They are just rubbish aren't they? Everyone hates lectures and erm we mentioned attention span earlier on as well, attention span is 12 minutes at the best of times so to be able – that's in study – so to be able to sit there for an hour and take everything is a bit unrealistic sometimes. Any other good bits about your.. you were going to say something?

Erm like what I've got to do home learning I always struggle to know how much like how much detail you've got to go into and stuff, I like being told what to do a bit more.

Yeh yeh so you'll all be different so erm again I like to be spoon fed a bit, I like to be given objectives so I know I can hit the objectives and if I learn that I'll pass and its easy and I'll write it out and write it out again so I kind of think, what didn't we like about the teaching looking at videos and coming in, was there anything we didn't like? I need you to be honest about all this too.

I think it was quite easy to get distracted and not actually pay attention to the videos when you've got your equipment in front of you.

Yep ok yeh

Where theres things that are simultaneous, you kinda miss what's going on from the video

Yeh yeh

So may be just take a break and say now watch this, I know we were rushed for time so,

Yeh yeh, anything else?

When you open the lecture, obviously we didn't have lecture so I felt there was quite a lot of stuff I hadn't seen because I had just watched the videos so I thought I don't know this.

Ok

I thought the videos were better than the lecture.

Ok

Another thing, I think sometimes with lectures, coz like they only put the main points on the lectures, if you haven't been to a lecture and you are just reading it, you think I have no idea what this mean but the videos put it into context

Yeh you can follow it right from the start right to the finish.

I personally thought I don't think one or the other was not better, I felt they were better together, like if you had both to be honest, just because, I know the video like you just watch it quickly, but then sometimes I feel like if you have a lecture you can just read through it and then its just .. I don't know I wouldn't go back and watch the video every single time if I wanted to.

Yeh ok

Do you know what I mean? But then if I wanted to see what to do, I would but then like its like listening to the video I don't know how to explain what I mean but I don't know. No, I imagine, like no offence (laughter), it was quite short so that was good like coz it was literally like a minute.

There's not much too learn is there just sort of..

You know like our 3rd year lectures that we have got, is there any chance that they could record them?

There is a chance everything could be recorded and put on a virtual learning environment for you which might be Vital or something else I don't know

Coz you know like with oral med we get the lecture recordings and then we get them and they are really useful because sometimes when we have got lots of pictures and you know like you make notes as you go along, but sometimes you cant put them together, so I find that with oral med its really useful so if you could do a similar thing for ortho that would be a really good idea.

A similar kind of thing I think because oral med is very much a look and you see and you treat after history obviously, you need to look at ortho and its maybe not like other things, so its quite interesting that you said that. Erm we all sound like we've watched the videos, where did we watch them? What devices did we use? Erm is that your phone, was it at home, was it in the library, was it on an ipad? What did we use?

I watched it in here.

Ok just in here, so the majority of you. Ok the other group that's fine. Anyone else? Anyone in the other group?

I watched on my phone.

Yeh your phone. Did you find that easy?

Yeh.

I can it on my phone and it works within 30 seconds so from lifting it up to getting it and all the rest of it, so erm that was important to us the idea being you could be in bed and watch these things and you don't necessarily have to come to lectures. Anyone else got anything to add to that? Where the videos good for your individual learning?

Yeh.

Yes or no?

It reaffirmed what we had in the lecture, it touched on bits that weren't actually covered in the lecture. I feel like, I don't know whether this is just because we don't have one or the other, everyone who had the other one said that's better, everyone who had that one was like that's better or like those things that were in the video that weren't in the lecture or there were things in the lecture that weren't in the video.

I see what you mean yeh.

So I don't know, maybe like the videos are really good but then maybe just like something to be like ok this is also the main point so just so its like, but I don't know, I think they work better together to be honest. But I don't think you necessarily need to like have the lecture where somebody needs to explain it to you because if you have got the video then they are explaining it to you, do you get what I mean?

And youre all clever people

Yeh just like a sheet basically just to be like this is something for you to have a look at to go with it kinda thing.

Yeh

Because we are so used to lectures and just like having that like..

So lets come onto to that now then, so that's maybe, is that an advantage or a disadvantage of lectures then?

I think I like lectures more as like a revision to go over then, at the time when I am learning brand new I don't really like lectures but if its like say we had a revision lecture the other day on a completely different subject, it kinda helps consolidate it a little it, so maybe do the video to help people learn it and then do like a little revision lecture to like..

Yeh yeh. Anyone love lectures? I know we don't have a massive fan in you.

I don't mind it.

For me the maximum is an hour or so and then I start fidgeting and look around the room and kinda drift off sometimes, within that time I quite like lectures but..

What about you, are you the same?

and summarising is good coz like there is more conversation and you are more likely to I think interactive ones are good coz you are more likely to remember things by asking questions remember, so interactive is good.

I do like lectures.

I don't mind then but you know like the ones we have got are way too long and they we have got so many of them back to back and it like I think maybe we should get a lecture and then a seminar after that to like consolidate it rather than have a load of lectures in 3rd year and then 4th year just get seminars, I think they like they need to be kinda together, coz I don't really learn much from like the lectures and then the seminars are like oh ok that's what they were on about it kind of and it started to make sense.

Right ok.

Like that's what I was trying to get at but didn't articulate very well.

So say in the 3rd year lectures because it was like full days of like say 7-8 lectures if they had a voice recording or something that we could reference back to, so like its 3rd year all these lectures and half of the time its like oh ok I'm not really too sure what its actually talking about which is why it makes it less like helpful, so ok I'm not really sure about this..

And you turn up to the seminar and its..

The seminar made everything clearly make sense like 4th year I feel most of us kinda started to get it but for me personally 3rd year I was clueless

Yeh

To be honest I don't think I have even looked at 3rd year lectures after that, I have used the seminars personally and to be honest in 3rd year I literally go and just like seminars the ortho questions (laughter)

Ortho like it was actually confusing, coz I said to my friends like we'd go one friend and we teach (laughter)

One person would do and just tell everyone what it is.

The person who got it like used the book to teach, the book was really helpful.

Ok.

I don't think I knew any ortho in 3rd year.

I just thought, you know what, I could pass without it and just ignored it (laughter) coz stuff like ANB and all of that it just didn't make sense to me in 3rd year and like now its like what was so difficult?

Fine, I don't want to go on for too much longer. Erm we have spoken a little bit about that, I want to talk about, we have spoken about flipped, spoken about traditional, erm I want a quick vote or a show of hands who preferred what and whose kinda indifferent? So those of you that preferred the traditional normal lectures hands up, who liked it? Who would want to do that? Who preferred the flipped doing it that way and having he videos and coming in? yeh

Is there a?

No there is a different option as well?2? 3?

Ok and the rest are indifferent.

I wouldn't say I'm indifferent, I would say I want both.

So if there is one you would pick..?

If there was just one, then I'd go for practical videos.

If I only had the choice one, I'd have that but if I could have both I'd rather have both.

I'm going to change that now to both, so who would like to have both if they had the opportunity? So everyone! Ok.
Here is an interesting question because you are all here to basically pass, to do well but you are also here to learn and go out there and work and be safe and all the rest of it, we gave you a quick assessment to do, which method do you think gave the best exam results? You have spoken about satisfaction but what one do you think actually gave the best results? Or gives the best results in general?

The lecture.

The lecture yeh.

I think the other one a little bit because I felt in the exam I didn't know, like there were somethings, like picture of things like what was that I've seen before and I think its in the video, so I think if I had seen the video before I might have done better.

Ok ok.

I was happy with the assessment and having the lecture.
Lecture.
Llectures.

Ok erm fine erm what I want to do now is just quickly go round the group to finish from each of you and we'll go this way round because we went that way round last time. Erm a sort of closing statement really, so what you prefer, why you liked it, what you didn't like about and how its going to influence you going forward ok? So if you can think about those things. So what one did you prefer, what one suited your type of learning and if you had to change something what would it be?

I think I preferred like the video a little bit more just because I felt like it a little bit more detail compared to the other lecture. I think I would prefer it if we had a video but then like had a handout just to kinda go with it so we could just refer back to, just something we could print out but yeh I think both of them together would be good.

Yeh that's a good point.

I think the video is good in terms of memorising because its easily memorable, like a lecture is more easily engaged with a video so in that sense it good but I do think both together would be better.

Ok.

I like the flip learning but I feel like I wanted a bit more knowledge before so even if I just had slides I could flick through slides didn't have to be an actual lecture, just high volume information to trawl through pictures and get a better idea

So pictures, papers, links, handouts?

Even if it was just a lecture and it is quite quick and you could have them and then watch the videos.

Ok ok that great, cheers, thank you.

I think like the videos but again I feel like maybe a summary or a crib sheet or just something to go with it and again if it was that combination that I preferred that to a lecture but just something written down and I feel like it is a comfort blanket just like to have a summary or notes or something that's just like that rather than something that you are just watching, again a combination.

Ok yeh that's a good point.

I agree with what's been said, probably prefer videos but something else to go with it at the same time. I think that either way what this has taught me is to look a things

with a bit more rounded like you must pass the test like the reason why you are sitting these finals is to you know to give the best option to the patient rather than to just pass the exam, to look at it as that patient type of thing is a bit better I think.

Ok yeh ok great thanks.

For me I think the video worked best. I think it is just how I learn so seeing like an extended wire seeing someone cut it would stick more in my mind more than reading like if there is an extra bit of more cut so I think the videos work best for me but again having a hand out like so as I watch the videos like annotate it.

Ok that seem to be a recurring theme doesn't it.

The lecture was good for giving like the basis of the learning so you had gone through it and if you had listened to it then the fundamentals were there, then when you got to watch the videos then you could apply that to the practical learning, so you have got your notes, you know the principle with having the videos you can see how it is done and so you can put your theory into practice whereas I think if I just had the video s you have to be quite proactive to actually sit and watch them as kind of a lecture and then after this.. it is quite easy to ignore the video I think.

Ok yeh that is a really good point that we didn't really talk about.

Yeh the same really, I prefer the video but with like a handout or just something you can go off a well like make your own time and stuff.

Ok great yeh.

I agree, I think the video, especially with a summary, makes more sense because if you are going to deal with an ortho emergency I feel like you should know and have done something before rather than somebody just comes in and you are like I just had this lecture 4 years ago but you just remember that..

You remember my seminar!

Yes, so it works but yeh I agree that the video and a handout would be perfect.

Ok. These are all good points and it seems like that is a recurring theme. I understand what everyone is saying about the idea of the videos is somebody who spoke about visual learning so that would tick that, some people would be pragmatic and practical learners they like to get in and do things, they are the person that maybe opens up a package from Ikea and just dives in without the instructions, they learn by doing. The audio learners, the person who sits and listens, how many of us know all the words to our favourite songs because we listen to them all the time. Writing, there was some writing in there, they were key points that were in, maybe we can expand on that and do a lot more and turn it into an actual handout that you print out, annotate and bring along with you. Erm, social learning as well, coming back and talking about problems, sitting in groups, watching your mates do it with you, how you are doing it, how am I doing it wrong, that kind of thing, so there is a social aspect to it, so you can see quickly just watching a video at home actually turns into something that it quite well thought out and that was the idea behind it, erm so this is something that we will probably look at then. I am definitely going to have a good think about printing off something next year.

Erm thank you for your willingness to participate and come today, I know you are all busy. Your exams will be fine I'm sure. I didn't do anything for my finals, so that was fine, I'd done it over and over again by the time I got round to it I just thought you know what I'm going to be ok here and I was so! So just relax. All your comments are going to be confidential you don't need to worry about that and you have all signed in and if you want any food goodness I didn't know what to get so there are sausages over there, there's pastries, there's teas, coffee, juice, biscuits, you don't need to have any of that stuff if you don't want to, if you want to get away that's fine. Ok thanks for coming.

Appendix 12: Verbatim Transcription From Focus Group 3

To record on this eh phone ok? So erm that's simply because erm we want to type up your responses erm and there's 8,9 groups or something like that, so we cant remember everything that you say, that's all, so we can't have any names, keep everything anonymous. What we would like though is more of a discussion across the table rather than just coming from me. Alright, so I'll lead it, but I kinda want you guys to take over. Everything you say is confidential. So don't worry about that as I said and erm, how many of us are postgraduate students here?
1? 2?
3!

Ok fantastic. So the first thing I want to talk about is our individual learning styles. Now when I was in 5th year, erm I got to your stage and thought goodness I have got these final exams coming up, I should really do some work for these and then I thought to myself ok I'm going to do some work and I started writing things out and then I started writing it out a second time and it took a long time and then thought ok I'm not sure about that I need to write that out again and I thought that's probably not the best way to do this. Erm so what I want you to do is think about, while we are going round the table just think about how you think you learn best erm and whether you know how that relates to any sort of learning styles, theories, principles anything like that. So maybe we can go round this way?

Em Yeh ok!

Since you are sat next to me in the hot seat!

Probably I think when I have a lecture or something like that I can retain that information for longer than if I read it, so listening is probably the easiest thing, but in terms of actually sitting down to revise for an exam, it's just repetition of reading over and writing things out I think.

If that's what works for you, that's fine, that's what I did

Erm, I think I am slightly different, I like to do things you know if I am trying to revise for something, I try to in my mind practice doing it, so err if I'm thinking about lets say its my extraction session tomorrow, I'll play it up in my mind as to what exactly steps are that I am doing, as opposed to just writing it out I think, I forget very quickly if I just write things out.

Ok ok. Do you find it difficult then to think about things? because some questions don't lend themselves to visualising yourself in that situation?

Somethings are very abstract and I struggle with those questions

Dental materials has just come out of my head!

So for instance, quite a lot of the ortho questions because we don't have any clinical sessions really for ortho, a lot of it, even though it makes sense when you read it, when you ask questions about it, it doesn't quite make sense to me if that makes sense, whereas if you have a session of doing it, you can actually link it in better.

I'll come back to that, that's quite interesting, good, great, thanks.

Ermm well I used to make really nice sort of notes and then I realised that that was like not really time efficient, so I know I just literally read and write and write and write in like a scrap book over and over again, that seems to be better for me.

Yeh yeh

Than sort of looking at something all the time.

I was kind of slagging my old self off but to be honest with you I still do that, exactly the same as you!

No I did that in 3rd year and in 4th year I just read and read and then wrote it again repetitively, like loads of books and that seems to work better.

Ok great ok fine ok thanks.

So I found with dentistry there is lots of photos in lectures and stuff so I type up my notes on a word document and then what'll do is erm go over it, read it first, this is what I am doing this time, go over it, read it first and then I'll shorten it into onto little revision cards and then I'll go over that and shorten it even more, so then I'm literally just looking at a word and everything pops into my head.

Ok ok so its like kind of condensed down, so you have got your lecture notes then a summary and the write a summary of that summary so before you know it it's down on a postcard type thing, until you can see the word stainless steel and you can kind of remember everything else that has come before it. Ok that quite interesting a few people have said that today.

How about yourself?

I think when I am learning something new, or try to understand something, I need a lot of context erm so I kinda just need examples and to really understand why we are using something for a certain situation so that I can link it in, otherwise if it was just like in a lecture in bullet points, and I have got no case or understanding why we are using stuff, I just won't retain the information coz I can't work out the answer, so I'm not good at just remembering things not having an example.

Ok so how do you get that example, are you reliant then on material or will you actively go out and try look for,will you read in a text book the background to give you some sort of context?

Sometimes I have done that or I'll just ask someone else who maybe understands it a bit more, to just give me an example and then some lectures do like have cases and that's really useful.

Ok so these cases then, these worked examples, is that more erm a descriptive thing or is that more photographs, is it..?

I am more like a visual learner, so photographs do help as well.

Ok great so you've noticed you're a visual learner or partly a visual learner? Ok thank you very much we'll come back to that.

So I type up all my lecture notes like soon after we have had the lecture, but I also have to look at like text books and papers just sometimes to give the lectures like a

bit more of a substance, just to help me understand it coz sometimes you'll just a lecture with just one word on it and like just one picture and it will tell you what it is but I feel like in order to understand it I need more information and a lot of the times I gather that information myself and then through the revision process, my notes will get even more condensed, when I'm just revising off something like mind maps.

So you use mind maps?

Yeh

Ok ok that's quite interesting. Forgive me, so that's the circles with interlinks going off to another circle with more?

Yeh

So when you are in an exam situation, do you try and literally think of what that mind map looks like? Or is more just to give it context of what you are trying to learn about if that makes sense, the links the interlinks between different..

I think it is more like the interlinks between the different things coz I don't like lectures to be like completely separate like I can find like links between different lectures and pull them altogether within all the different specialities and feel like..

That's important to you?

Yeh I feel like that helps me, helps me answer the questions and helps me understand it more and then also when you come into practice it isn't just going to be paeds or just ortho, you will have to treat the patient like taking into account like everything.

Yeh yeh of course, absolutely, bit of a different spin on things that we've heard today so that's quite interesting so we'll come back to that definitely as well, lots to come back to! How about yourself?

Erm I think I find lectures like really difficult to learn from, like when someone talks at me, I just can't concentrate, erm so I have kinda like gone through dental school just using text books and making notes from text books and when it comes to revision time, I will just like condense those notes further erm and that's worked quite well.

So text books? So you literally go to text books as your number one?

Yeh I literally hate lectures, Ilike really liked PBL, I think I might be the only person who says that! erm and then, but erm yeah other things I learn better when I do it practically, so like crowns I kinda learn the best, if like somethings gone wrong when I have fitted a crown, I'll learn more from that than like reading about like…. Not that all my crowns have been made or anything but you know, erm yeh!

Erm yeah ok so a mix of things then, so written descriptive learning, condensing things, writing things out whatever, actually doing things so practical and interestingly if things go wrong as well, so if something goes wrong, do you learn from it more, or learn from it less do you think?

More because I think I might stay mentally scarred by like the situation!

Ok, that's all quite interesting stuff there so we have got lots to come back to. We will come back to all these things, erm first of all though I need to go through what we have got here, so we approached the idea of flipped learning, this concept where we do ourerm learning outside of the classroom and then come in so time is not wasted just acquiring the knowledge, we have already done that and instead the time is put to better use to doing problem solving erm in other areas you might have different sort of scenarios or different specialities giving you problems to work around, for us it is very difficult in orthodontic emergencies because nothing really lends itself to crossover, so what we tend to do is eh give you thinks to use like instruments, have a play with certain things, then did we find that watching the videos and playing with the instruments useful, yes or no?

Absolutely.

Yeh

Yeh

Yeh yeh, can we expand on that?

Well like I said before, it is very, like even watching videos for me sometimes I find difficult to get me to learn things. So erm watching the videos on their own was great but then actually practicing it made it stick in my mind more if that makes sense.

Ok yeh

And because, I just feel you can't, you can't put it into context how difficult something is to do unless you do it, so it is easy to watch somebody who is a professional doing it and you think oh yeh that looks easy but then you try doing it yourself and it's like well that's not so easy, but you learn more from that process because you are thinking about it more, you are thinking about using your hands, thinking about what you are trying to do, what you are trying to achieve.

Ok so you are placing a heavy emphasis there really on practical learning, and so you feel as if actually doing this obviously benefits you?

Yes.

Just before we come to the practical side of things, let's talk about the videos and doing that first of all because it is really 2 separate issues there isn't it and the video is useful doing it at home?

Yeh because you can play them back not like a lecture where they will say something and you have missed it and

Then it's gone. Yeh. And Would you always as a question in that situation or do you thing some people are hesitant sometimes?

Do you mean in a lecture?

Yeh, say they've missed it and they think oh I've missed that, do you think everyone would ask a question?

I don't think so, it's kind of embarrassing.

I usually ask the person next to me!!!!
Yeah same!
Yeah

Ok!

But then you miss the next bit because you are talking!!

And then they ask you!! Haha, Ok so fine erm you can ask questions erm when you miss things. Anything else about watching videos at home? Did any of us particularly enjoy that? Can you see yourself doing that from your own experience?

I think it is good that they were short, I think if they were any longer, I probably wouldn't have watched them or sort of stayed interested in it but because it is short and to the point, whereas sometimes they have got recorded lectures online but they go on like for dunno 40 minutes or so and you are sort of skipping through the slides until its over.

Ok I am trying to figure out at what point, obviously if a lecture is an hour long and you have got an hour long video of that lecture, it is probably less likely people are going to watch it. If its 40 minutes like you said, you've just said people are less likely to watch it, so at what point does it become ok I'll watch that? See what I mean?

Yeh, I think it was, well for me it was more because like in the videos you were, well most of them, you were doing the stuff while you were talking, erm so like for me I wouldn't mind what length it was coz I was more kinda, I dunno, it was more interesting, whereas the online lectures it was literally the slide with one word and they are talking you just like, oh it's so boring.

Ok so you kinda lose interest? ok.

Sometimes you know you have to watch those long videos, coz I remember like, I think it was oral med we had a salivary gland and that was like an hour and something, but we knew we had to watch it coz when we went in we were gonna be like tested on it.

Yeh

And that was the way that worked, so I think everyone actually did watch the whole thing, coz no one wanted to sit there and not know what was going on.

Ok. Yeh ok. So you think that would be a good thing, a good strategy? I'd hate that haha but you think it means people learn better?

I personally learnt quite a lot the way that sialogram lecture was done, Ive not actually had to go back and like look at it again because it has just stuck in my head, but that's just me coz I know everyone else is different.

So you can watch it at your own time as well, erm erm its short, erm its got commentary so its hitting 2 types of thing – you have got the visual learners as well as the auditory learners as well so it interlinks between the 2 different things, so anything else that people liked particularly? anything else?

I think it is different in our course because we are in all the time on a clinic and things like that, if you still have a time tabled session and then have say, I don't know, 3 hour long videos to watch, that's like a lot of time, so then, but in consideration to somebody who does like a humanities course, where they wouldn't have the lecture but it would just be a video, so it depends in terms of how you were using the videos, where you just kinda adamant to do a mass and it takes up a load of time and then does anybody really benefit, or is it going to be used instead of something?

Ok yeh, so that's a potential down to it isn't it? Are they are any other potential downsides of using these videos? Are we all going to watch these videos? Do you think you would watch the videos?

Truthfully I haven't watched it.

(Laughter)

I'm sitting here quietly because I haven't actually seen these videos!

But that's something we need to know, we need to know if people are going to actually watch them you know.

But from my experience, the videos from other lectures on Vital, the best way to structure it is when they have titles of the different slides on the side, then you can click through you know exactly ok that's what this is going to speak about, so it's just not one one hour long where you don't know where everything is.

Ok.

Because if you need to go back to something, just need that one thing explaining again, then you can go to it really easily.

Ok. Yeah

Or even have it like have the video but also have like the lectures as a PDF as well so you can like download it and annotate is whilst you are watching it too.

Ok fantastic so we'll come back to that at the end, so that's something that a lot of people have said so that's good. Anything else we don't like about lectures? So there are things we could add to it, we might not watch them, they may add time onto the classroom, they might add to classroom time. 3 hours is a lot isn't it?

Yeh, it depends if if it was a video and then the classroom would be something different, then you do gain from it but when it's a video and then you go back to do the same thing again, if it was the same thing it might put somebody off watching the video coz they think I don't need to watch it if I'm going, so it's a bit of a vicious cycle.

It definitely has to replace something doesn't it really relies heavily on people doing it doesn't it because if they don't watch the videos they are not going to get the knowledge that they then need to apply and all of a sudden are behind and then if the course is then quite quickly progressing and moving on, you could get left behind. Ok let's talk about conventional lectures then as well. So we have all had these lectures for years erm they have got good things about them and got bad

things about them as well. What are the good things about them for you? What are the good things?

So from my experience, I think that with lectures a lot of it for me depends on the actual speaker and whether they have got that charisma where they can engage the crowd, you know you get a lot of lecturers, we all experience it when we are sitting in a lecture, I don't want to mention any names but you are sitting there and you are literally nodding off, or fighting to keep your eyes open, but there are some lecturers who actually engage you ask you questions and that keeps you awake and keeps you in the process but

Even like if we are talking specifically about ortho, like breaking it down a bit more, especially when we are doing something like for the first time, and like I personally felt like out 3rd year lectures were a bit of a shambles and I thought they were like not the best lectures, it was difficult to understand from them, like I remember sitting there with like a text book and basically self-taught myself this lecture, just because it was so hard to understand like..

You talking about seminars??
No
No
No. Seminars are really good, it's the 3rd year lectures like you know block and we were there for an hour and a half, 2 hours and someone was just standing there talking to us about ortho, bearing in mind this was like the first time we had done it.

Yeh, I think its because..

And there is appliances coming left right and centre, it wasn't structured like, I feel like if we had the 4th year seminars first where they broke down from like the Class system and then had the 3rd year, it would make a lot more sense, like the 4th year seminars were really structured and told us like if it's a Class II DIv I this is whys its caused and this is how you treat it, like that instead of just throwing loads of appliances and be like this is for this and this is for this this is for this. I don't know what a Class III is right now.

Yeh yeh yeah because its confusing yeh. So all I have done today is listen to people tell me the same thing, so eh give 3rd year lectures a miss! So we'll talk about that a bit later on. Erm so its relies heavily on the presenter and charisma, there is a lot of other good things about conventional lectures though, does anyone sort of like them more than doing it at home and PBL and sort of learning stuff?

I think it is a check list for me because you know like everything you will be tested on, most of it will be in the lectures. So it's kinda like after you have done all your other revision, that you you sort of have a quick read through the lectures just to make sure you've not missed anything.

And it gives you sort of aims and objectives and things doesn't it so it keeps you on track?

And also if you've got a reading list at the end, you can go back and like some people that like to condense their notes, I tend to find I write more than less, so its good to have a reading list to refer back to, to get more out of it if that makes sense?

Yeh oh yeh definitely.

I like the lectures just coz like it's a set sort of what you need to know and then I just keep adding and adding things to it from books and sort of online and I find that like when I condense it down I am missing out sort of small points that are actually quite important and then I lose the context of what it was, whereas a lecture will tell you look this is what you need to know and then I'll will look around that topic of what the title was and it will give you like the basics, so I quite like the lectures in that respect.

Ok anyone else got any other things that they quite like about lectures? It's normally given by a specialist isn't it? so you can sort of feel trusted that what they are telling you is true.

Even asking questions like if you are unsure about anything, even if you don't want to say it during the lecture, but after you can go up and ask questions and at the end obviously people ask questions as well.

Yeah yeah, would you feel comfortable emailing the lecturer afterwards? And more importantly would you feel confident that they would get back to you?

I think it's the confidence that they will get back to you, I don't mind emailing but you know waiting 2-3 weeks for a response! (Laughter)

Ok Fair enough. It that something that is a problem for you at the moment? For us at the moment.

I think it depends who it is

Depends on the tutor.

Ok so it might be a problem depending on whoever it is. Ok. I think we'll leave that there. So that's the eh good things about the lecture. We have touched on some of the bad things em – nodding off, it always happens!!

We are all prone to it!!

Definitely definitely! Erm so the other things that I want to talk about erm at this point, I want a quick show of hands actually, so who prefers, does anyone prefer normal lectures to the idea of a flipped concept where you are doing some videos at home and research home, more specifically videos at home and coming into do practicals in orthodontics, so traditional first of all, normal conventional lectures?

In ortho, just ortho?

Yeh

I think the way that it was done this time, I'd preferred the practicals and the videos, but I think if it was sort of all the appliances and everything behind it, I would prefer a lecture personally.

Yeh ok

But the practical side of it, then videos and doing practicals is better, but for the theory I would prefer a lecture.

Ok so erm lets come back to appliances because that something I want to come to in a second, erm can I have a show of hands for normal lectures?

- None
- Videos? Is that everyone one then? Yes so 7.
- Erm if I then gave you a third option of videos, coming in for practical session and then giving a handout similar to what you would get in a 4th year seminar for example.

(All hands go up)
Yeh
Yeh
Yeah
Yeah
Just to reinforce knowledge with it.

So everyones in solid agreement with that then? Ok. Erm we spoke, it sounds like that pretty much in terms of satisfaction that that's a winner. In terms of exam results, how do we think that that would help us, because that's something we need to think about we can't just replace lectures with videos and then everyone starts failing. Do you think that would be the case? Is that something you would be worried about as students?

I think that if I had the handout, then I can add whatever I want to it but then I guess you know that you have given me the information that..

So handouts are critical really?

I think so

As a check list

Yeh

It keeps you on track.

It's getting everybody on a baseline coz if nobody has a baseline everybody is at a different point, then there will be some people who will get left behind.

Yeh yeh ok, absolutel agree. Erm let's talk about the seminars and these lectures, it is a full week of lectures in 3rd year?

Yeh it was ortho week, yeh you have to do a presentation at the end as well.

Ok so following only 3 groups this morning we possibly might change around the curriculum which is not going to help you! But you have been the catalyst of that. Do you think it would be better to have the seminars first of all taking you through from scratch to that point, then possibly moving the block if we had to keep it, let's just assume we have to keep it, and move to sort of 4th 5th year when you have got better understanding of what to do?

Yeh
Yeh

Or just get rid of the whole damn thing altogether?!!

I think maybe like an introductory lecture first would useful, just to break everyone in and then build it onto seminars.

Ok ok yeh

Because I think if you just threw 7-8 people in a room to a seminar, I don't think it would be that useful straightaway, I think a few lectures first and then maybe seminars.

I think also in seminars we had to do a bit of pre-work before it, which actually did help

Ok great ok, so you are actually doing that at the moment? How did, I am interested to hear what your thoughts are about doing the seminars because these seminars are often broken down into things like Class II Division I, you said to me that you like the links in between different things, does that, do you feel as if you were still able to learn effectively?

Yeh because I feel like in order for me to make links, I need to understand the basics first. So in 3rd year I didn't understand the basics at all in ortho and when I got into 4th year and then we started doing the seminars, I was able to understand it more. and then like I was able to make like links between the different things or see a picture of an appliance and oh like I know what that's for, I know what Class it is and what can cause that Class like and stuff like just because we have these seminars and it wasn't like literally just like 2 hours listening to someone talk about different appliances that you have no idea about.

Yeh ok erm you have mentioned the word appliance there and I have heard the word appliance before from a few of you there so erm is it our feeling that we sometimes we don't know what all these weird and wonderful appliances do?

Yes its because yeah its because its not in context you just see a list of pictures and you are almost trying to remember by row what they are

And truthfully, even for my revision now, I've wrote learning appliances and thinking I don't really know how this works but I just know it is a Frankel appliance or a Herbst appliance

Ok yeah yeah yeah , would it help you then to see a presentation or a summary just on appliances?

Yeh

We had that lecture on appliances

We had that seminar on appliances

Oh did you, oh ok

But something else like adjunct to that would probably be helpful.

Just something to support that? ok

Or a practical thing how we are seeing they work and the specialist can explain in small groups.

I think sometimes because ortho is not something you do as a GDP but people who are lecturing kind of forget that we are going to be GDPs at the baseline so they are moving on 10 steps ahead and we haven't even started, so it's sometimes remembering that we are at like baseline and we need to know what Class III even is. Before we need to know, what the different appliances are.

Yeh yeh, the appliances to correct a Class III ok yeh ok. That is something certainly we can incorporate. I want to go back to videos very quickly because the other groups have been very erm they mentioned You Tube quite a few times, does You Tube come into our learning at all?

Yeh I use You Tube quite a lot.

I use YouTube a lot.

Yeh

Yeh

Yeh

Wow that was a wide explosion of opinions there! Maybe we could have one at a time?

I think You Tube is great, I use a lot of different universities that put videos up on there.

Do they?

And if I don't understand something, I just type it into YouTube and there will be a video or a few videos I can though.

Ok yeh

There's a couple of times where I have used You Tube and it's contradictive to what we've been taught and you know tutors are like don't use You Tube just stick to what weve taught you.

And I can understand that to some extent, it need to be policed because you don't know if it's going to be great or absolutely nonsense and its great it it's come from a university and a respected source but if it's coming from a specialist you don't know if that's right or not.

But even different universities have different approaches to things so quite a lot of videos around from Kings and like some of their techniques like erm Class II erm fillings erm quite a few tutors don't agree with it, so like Kings would use like the mimimal invasive technique whereas here they want you to clear all the margins, erm make sure you clear all the caries whereas at Kings they allow you to leave a little bit behind if that makes sense.

Anyone else any positive experiencse with YouTube?

I think it is really good. Even if you are not using the technique that they are doing, it sometimes just seeing it, if that's what you are going to be doing then you have a bit of an idea to contextualise how different instruments are used and things like that.

I mean I use Instagram now coz I follow so many Instagram pages that it shows me how to do a perfect composite and I pick up skills from that which we haven't been taught yet, other than that advanced composite course but yeh I just learn different techniques from even Instagram. Social media is a big tool nowadays.

I do too eh with ortho stuff yeh. Anyone else?

I am like a really untrusting person, so yeh.

4 nos for You Tube left is that right?

Mine is just the odd time if I really don't understand something I'll you'll know ask someone else, look in a text book, go back to the lectures and stuff and then if I'm really stuck then I'll just tap it into You Tube and try and see some sort of video or practical element that might help me if I see it in a different way.

Ok yeh so very much the same?

Like sometimes it has helped, sometimes it's just like this is not what I am looking for.

Yeh sometimes you know there is often more than one way to tackle something so it might be completely different but it still gets you to the same end but because you have not been taught that way erm its almost if you don't know if it is right or wrong as well and it is difficult when you have no exposure to ortho erm probably won't really get any exposure to ortho statistically because not many do from this group so it's difficult. Any negative experiences with YouTube other than being not sure if it's the right thing or not?
So if we can, what I'm trying to get at is that if can ensure it is the right information and have a mini series of lectures on You Tube, is that something that we should definitely be looking at?

Yeh

Ok and if we could maybe supplement that with a handout on appliances and a You Tube video of appliances, maybe a sort of little cartoon of what they do or something like that, a little animation to make it easy? Ok. Videos as we have been learning today get used in oral med and oral surgery from here erm how is that? what is your experience of that?

Good.
Yeah good.
A good experience?

Oral surgery was good but she also did a handout with them and I think I appreciated a handout maybe more than the video.

Ok ok interesting. Do you think the 2 are needed in combination?

Yeh if I had to chose, my first port of call was the handout and then I went to that to read it to understand what was happening and then I just watched the video just to

see ok that makes sense but I can't say I sat down and watched every video religiously.

I think for me because we have been doing oral surgery for a couple of years, they have only just recently put the videos on, we have kinda been sort of doing it

So you think all this is obvious then?

Yeh, some of it was.

Yeh I didn't realise there was a handout so Ive just watched the videos! And I just thought they were fine

No, there was a few like labelled stuff but yeh.

Yeah because we have been doing extractions for a couple of years now, its nice to have but it would nicer if we had had it..

Yeh that's true, maybe we'd had it in 3rd year.

3rd year?

More people would have appreciated it quite a lot.

Yeh ok so a similar sort of thing for ortho maybe in 3rd year with different bits and bobs. erm that's fine, I was going to say something else but the word has just gone out of my head, there you go, that's life. Erm can we go around the group just to finish off here, and what I want to know is (we will go this way this time), erm are you open to using videos more in your learning and having a little bit let's say of practical stuff in orthodontics and maybe a handout, would that be something that you would actively push for? do you think that would be better and then just going to lectures?

Yeh definitely.

Yeh yeh ok fine. How about yourself?

Yeh I agree, even like maybe being the opportunity to go onto clinic as well, because like we are all 5th years and we are about to leave soon, like none of us or the majority haven't even measured something so simple as an overjet, I mean it's pretty poor really.

I've not even seen a ruler!
Its just a ruler isn't it!

Yeh yeh its ok saying here's a ruler but I've no idea how you do it. And then what happens if one tooth's like that and one tooth's like that, would you measure two?

No idea.

That would be the difference between someone getting NHS treatment and someone getting £4000 treatment, so it makes a difference, erm

So we don't know how to do that, and that's stuff that we do need to know coz that's the stuff a GDP does do!!!!

(Laughter)

Like I feel like oh yeh its all good and well to know what like I don't know like what a twin block does and like we've got a couple of lectures on it but none of us know how to use a ruler to measure an overjet because we've not just done it.

What I think would be useful as well because we see on paeds clinic we sell all the guys in green ortho stuff but we have never been over that side, it would be useful to have maybe one or two clinics on it just to shadow someone, and see exactly what they do, see them bring in a patient and do the IOTN or do some cephalometrics.

Like the treatment planning?

Yeh the treatment planning stage.

Yeh

Ok yeh fine

I know there was treatment planning,

I have had one

I have had nothing

It was at the very start yeh

Yeah I think they got cancelled because I think we had some difficulty. erm so you are going to graduate without having, have you seen a fixed appliance on a patient?

No
No
Only on myself!
Yeah only on myself! (Laughter) it's a real plus!

I have never had braces so I haven't actually seen a fixed appliance

I do obviously think about that, my own teeth when I think about ortho to think like, did I ever have this, does this make sense at all like because like it's the only thing I can relate it to.

I had a twin block, I understand what a twin block is, but if I didn't have one I don't think I'd know.

Yeh I think 100% practical thing, have a different appliances even on models, and a specialist explaining ok this is how it works, this is the biology of tooth movement, this is what functional appliances do like they are like tipping teeth and you know, fixed appliances are like actually..

We did have these seminars where we worked through like cases, but these cases were cases that like I think that the postgrads were treating and we had to like do a treatment plan, yeh it as good but how does that benefit us when we are learning to be GDPs.

So you would prefer a much more GDP orientated sort of seminar where you get given things like erm what patient would benefit from a twin block would look like, rather than knowing the ins and outs of a twin block?

Yeh
Yeh
Yeh
100% yeh. Related to what we are going to be doing really.

So I know people will like you know might end up specialising but they will do a course to do that so they will get taught on that course, well the majority of us are going to be GDPs.

Yeah coz when a patient's mum asks you so what kind of braces will they be having? That would be interesting

Ok yes.

Even on paeds now like sometimes coz its shared care with some of the patients like, I'll just call my tutor over one second

It would give you a bit more confidence then?

It was something paeds related yeh we'd know how to answer it, we'd know the advice to give a parent, but if it was something to do with ortho, I'd be literally like I'm just going to call the tutor just give me a second!

Do think you could make up for that in anyway, because you haven't had any clinical exposure, to seeing a video and watching wires getting cut kinda helped you think ok if my first patient in practice comes in and I need to cut a wire, I have seen a video on this, so it helps a little bit, I am not saying it replaces it, can it replace it?

No
No I don't think so.

No? so we really need to be looking at clinical exposure. That's going to help you out massively. Yeh, maybe it will, maybe it won't!! (Laughter) Is there anything else we want to talk about? I think I was going to come back to one of your points but I've forgotten what it was and I didn't write it down!

Mind map?

It was the mind map? I don't think it was because that was the interlinking thing wasn't it , the seminars are 5,6,7,8 lectures of whatever it is and I take it we have a handout for each of them and we print them off do we? Does that form the majority of your undergraduate orthodontic teaching training? It is just going to look at them and a few other bits and bobs and that's going to be it really?

Yeh pretty much.

So those lectures in 3rd year are kinda useless?

What's really good is the BDJ do like a Dental Update and its about 12 articles, I think I mentioned it you, its 12 articles explains everything so well, so you are

actually understanding how orthodontics works instead of just, I personally didn't think the seminars were that good. We talked about, you mentioned about how do they follow on from each other, they didn't really, they just were just kinda ok this is how you deal with an ectopic canine, this is Class II Div I, this is Class III

Jumping about a bit?

Yeh jumping about and I didn't really engage that well with it.

You do like have to beef them up quite a bit by looking up external resource like I think if you really want to understand something, I don't think the seminars were good enough so then that's why you look at external resources coz they have the links to all these articles in the recommend ortho text book and stuff, but if you just want to like memorise it for exams, then yeh they are great because they have got everything you need to know and that's where all the questions come from.

Yeh

But really the key is in understanding what is going on.

You see some people today have actually said they prefer to have everything categorised into impacted canines so I can imagine that and I kinda know what to do. Class III I can kinda imagine that person taking that similar and I can remember when they said something about a face mask for example. Whereas you are telling me, both of you in fact, that you don't really like that so much you preferred everything to be a bit more interwoven so you understand and sort of have that..

Yeh some sort of like storyline would be good not just.. Like a journey, not just this is this topic this is that topic

Yeh yeh maybe involving other specialities like paeds maybe or is that getting too? ok ok. So I started going round the room, you loved the idea of erm videos then we kind of went a little bit off piste there didn't we but essentially I guess what you are saying is that you are for it?

Yeh

How about yourself?

Yeh

Yeh you think it's a good idea, you think that will help you?

Yeh

Is that going to erm is that going to help all your learning needs, so by that what I mean is a video online in the flipped classroom to give you a bit of background quickly before we finish. You are watching it so the visual learnings are going to get help, while listening to commentary so its gong to sink in, how many of us know lyrics to 100s of songs? It is going to sink in. Then what we are going to do is er we are going to make writing on the slides so people who like to write stuff down, aims and objectives are going to learn that way, then we are going to come in for a practical, we are going to be sitting with our mates, we are going to talk about it so the social learners get a bit of interaction there, questions and answers with your friends, the sort of opportunity to ask the tutor at that point, time is not wasted, you

can watch these videos at home where you are most comfortable, so there is a lot of em plus points and also you are doing a practical thing, it is a practical course, it's getting you to do something practical so it kinda makes sense. Erm is that gonna is all going to be good for you?

Yeh as long as I get a handout!!! (Laughter) Yeah because then I can write down anything extra that I personally learnt from the practical session that I think I want to.

Would you like then for more words in these videos, almost make it like video power point type thing or would you just want a handout? Do you see what I am saying, there is kinda a difference?

Coz I think I have learned a lot from the practical but then the video would just be for me to go back to as well, in terms of revision, I could look at my handout and then write down anything extra from the videos if there is nothing I understood from the writing.

It is quite interesting because you are all telling me that the videos are a good idea but you almost want the video to be secondary to a handout

I think the thing is the video is untested so we have put up with 2 years of lecture and we have passed our exams with them, so as bad as they've been, weve passed the exams with them, whereas the videos are a new concept that you are trying so its like its almost untested.

Even like the questions and even the pictures that were used in our exams, they are from our lectures, like there will be a tiny sentence, I don't know the answer, it will be like a tiny sentence at the bottom of like slide 30 and the answer is just there, like everything is in the lectures that's what we get tested on, so I think that's why we want a handout, we want a lecture yeh!

Oh I see, I get it!

The videos would be good for an adjunct for that to get the understanding

Any may be those interlocking sort of context that you need for understanding, so I take it you are for it as well?

Yes but I need to watch these videos first though!!!!! (Laughter)

They are on Vital! They will be up well after your exams!

Yeh I think it is good I have used the handout and then used the video to supplement the handout, the other way round. That's what I'd do.

Ok so you are slightly different actually then? Ok.

I'd prefer videos.

You'd prefer the videos? Would you use the handout at all then?

As a check list like I said at the very end erm once I understand from videos just going back through it and making sure I have covered everything in my mind that I need to cover, because like there might be some, I don't know, some erm, something on data for instance like 1 in 10 children…… which may not be on video,

which you can't really explain on a video but would be on the handout which could be an exam question.

Yeah Ok yeh

So things like stats for instance that you probably wouldn't cover in the video, but it would be in the handout. If that makes sense.

Ok. It sounds like all your questions are in the small print!

Finally, yourself?

I would say a video with a handout,

So you were predominantly handout weren't you?

Yeh ok, anything else?

It's just mainly I think with the videos or with the teaching being outside of the dental school, it does gives, there is a bit of variation between students, it doesn't give everybody a baseline and I think from what has come out of this week, is that we didn't have a baseline from the lectures that's why we all struggled so it is making sure that there is something to be able to get that.

The handout provides? Ok. Super. So thank you for participating, thank you for your willingness to come in today as well, making a difference to next year. Everything that you say it confidential, so you don't need to worry about anything you have said, especially you!!! Erm don't forget to sign the register, and help yourself to anymore food that you want and that's pretty much it. If you have got any ortho questions, I am here for the next 5-10 minutes til the next groups comes in.

Appendix 13: Verbatim Transcription From Focus Group 4

Ok so I am going to record everything that we say ok. Em That's only because I cant obviously remember what I think its 7 or 8 groups of 9 people what everyone says. Erm so don't use anyones name I want everything confidential and that gives you the freedom to talk about anything, you can slag anything else, anything you want to it doesn't matter..

Bet they'll know my accent!!!!!

Erm The ideal scenario is that I don't talk to you alright, the ideal scenario is that everyone talks among each other and gives everyones point of view. Erm and that has been fairly successful this morning. Have we got any postgraduates first of all? How many have we got? Just 2?

I'm a postgrad yeah but I did the undergrad. I'll put that down as 3 then.

Ok yeh great. Erm so let me just start by erm sort of telling you a bit about what I want to talk about first. So I was in final year a few years ago and I got to the end of final year and I just didn't, I felt as if I didn't know how to learn which is a stupid thing to say because you go through school, you go through all these exams at uni and I came to the final exam and I was like, I should probably revise for this one, and I literally don't know what to do, so I just sat and wrote things out and then I wrote it out again, and then I wrote it out again and it was only afterwards that I thought to myself that it probably the worst thing you can do. And that's not going to achieve very much, its just going to waste time. So what I want to do is go around the room and for each of you just to tell me how you think you learn best. What strategies do you use and are you aware of any sort of learning theories, learning styles and principles or anything like? Tell me what you do. Maybe we can start with you!

The way that I study is that, so I read something and I write notes on it and we do the lecture and I read my notes and then I summarise those notes.

Ok so you are summarising the notes basically?

Yeh summarising the notes and condensing it into one page.

Ok and so is that, that's it? So like written information from the lectures keep going through it, that's very much what I did. You have learning objectives there to keep you on track and all that kind of stuff. Ok fine thank you.

That's pretty much what I do as well, although I have changed it now just because it doesn't seem to work at the moment, so I am making myself powerpoints with like pictures on because I am more visual I think and then I do the powerpoints and then I make questions on them and test myself on it. So that's what I am doing at the moment.

So there are a few things there, the visual, but theres also the writing out again because you are making the powerpoint again and then the questioning is something, now is that yourself or with somebody else?

No I just make up the questions myself.

Is that to help you understand a bit better?

Yeah

So Pre-empting exam questions almost?

A bit of everything just to help me remember it.

Ok good that's a few different things. How about yourself?

Erm so I make notes from the lectures first just so I know I have got the information there but then I like just kinda talking to other people about it like group study works for me coz if I am by myself I tend to get distracted.

And is that sort of erm weeks and weeks out from the exam or do you tend to find that you tend to do that at certain times?

So like nearer the exam or like once I'm happy that I have all the information I need in front of me and everything, then I am happy to just jut spend time with people and just got through questions, go through like just anything really. Lectures really

So nearer the exam?

Yeh nearer to the exam.
I was thinking if that's nearer to the exam what's further away from the exam, is there anything ?
Just going through the lectures really by myself though.
How about yourself?
So I'll read the lectures and then I tend to use books that have like, so like I'd use the orthodontic to read what is in the lecture, I just think it helps us understand it more and it has, like real life examples and questions like that you can, I think it helps like with the understanding in the bigger picture as well not just like isolated in that lecture topic.
Yeh yeh yeh ok, so more of your own study you would say rather than necessarily strictly staying with the lectures?

Yeh.
So very much words, reading
Just reading
Yeah? Ok thank you.
I mainly just copy and paste the lectures from the online platforms, it is just a big document and just go through and highlight them a couple of weeks outside the exam, just get together in little groups and talk through everyones different notes.
Yeh yeh so these lectures are already online somewhere are they? So sort of copied and pasted them into your own sort of thing giving you the freedom to annotate them?
Yeh format it
And then questions, so its like social learning there as well, you are talking to other people when asking questions and stuff like that? ok great. Do you feel as if erm if you get if you are successful with your questions or erm if you get a question wrong, do you feel as if one is better than the other?
Its better to have something I have missed out in the notes so I get the question wrong but if one of the others has got it right, it is better to talk through it that way.
Ok yeh get them to explain to you? ok.
You actually research it as well.
Ok that's great thanks.
So yeah I'll just makes notes but not just from lectures but from like from You Tube videos like explain different processes, I found that helped sometimes and then some of the lectures like that are recorded as well, so like I listen to those and keep playing back bits of things if I don't understand it. Do that to learn majority… go through notes and then once I feel like I know the majority, I just do discussions and tie up any lose ends. Like it's the best way.
So a bit of writing, looking at You Tube which is a recurring theme so we will definitely come back to that and erm on the You Tube it's a video so its like a visual learning type thing and also you are listening so its auditory so its quite a lot of things that you are touching on. Perfect we'll come back to some of them.
So I make notes from the lectures but I highlight those and put in bits from the recommended text books , then when I feel like I am starting to know that, then I like to ask questions with my friends, like we'll meet up and ask each other questions.

Ok great ok cool. So similar to you tend to find out a lot of you will be the same so don't worry if the answer is the same. Erm fine. So erm when was, have you all discovered this since you have been at uni or has it been before that, has it been at school or has it just been at uni?
More just kinda refined it as we have gone on.
Yeah
Yeah

I think you tailor it to each exam you at taking, like A levels it was a specification and I used to tick off each point, we don't get one ere so you've just got to tailor it to the exam kinda thing.
Yeh fine. Erm I want to talk about flipped classroom now. This erm concept where you do the know the knowledge acquisition outside of the classroom and then you are coming in to the classroom, not to just to learn something someone is teaching you coz you have already done that, but to actually apply the knowledge in a problems solving situation. So if you were in different disciplines like I don't know engineering or something like that, erm you would actually solve problems whereas we cant do that so what we tend to do instead is pickup forceps and pick up instruments and use them. How did, how do you, how does that idea sit with you? Do you like the concept of that idea or does that to you watching a video at home is that not something you are not that keen on?
I really liked it….
You really liked it?
…I really thought it out, its definitely, I understand the lecture coz I'm a lot more hands on, rather than someone just talking at me.
Ok ok great. So you don't tend to get a lot of clinical time do you so maybe seeing a video almost replaces that to some degree? Does anyone else like it?
Yeh
Yeh
Yeh it was good.
If you have got like a couple of lectures straight after each other, if you are just listening to someone talk for 3 hours
You stop listening!!

I understand that's happened in 3rd year in the series of lectures and
Happens in a lot of the years to be honest!!! Not just 3rd year!
Right we'll come back to that! what about the videos do we like?
I like that they are quite short, you didn't have to sit and watch an hour lecture coz when they are online it just feels like a lecture theatre and someone is talking at you.
Ok yeh.
So keeping them short and to the point, I thought helped.
So does that mean then that if we were going to do a lecture downstairs now and someone videoed it and it was an hour long lecture and an hour long video, would that mean that you are less likely to watch the video?
I would still watch it but more like flicking through it
Yeah
Yeah
And pause it and make notes, its under your control and a lot better than just being sat there.
Yeh because once you miss it, you miss it.
You can always go back later on and look at it again, that's why the ones online were good.
Ok yeh so people actually use these things..
I don't know if anybody else does but I do
Yeh yeh ok. Anything else that people like about them, maybe this side of the room?
I think it gives you like a chance to think of questions that you wouldn't think of on the spot in the lecture theatres, you have a bit more time to think about it and then ask the questions at lecture.
Yeh yeh absolutely yeh. Anyone else?
So things the other groups have said is you can watch it at your own time, so it doesn't have to be 9 o'clock on a Monday morning when you go to a lecture, you're probably not going to learn much anyway if you are a morning learner

It helps if you are a slow writer as well coz as we have said earlier, like you can pause it, you can google stuff at the same time like if it doesn't make any sense. So that's a helpful tool.

Yeh absolutely yeh. And erm the other thing is that you can watch in the comfort of your own home, we had somebody this morning that can only study in a noisy place, like a coffee shop, so erm they can do it there because that's where they are going to learn best erm another person can be in silence and watch it in a room, erm there is all these things, there are people – not you guys but obviously some international students a sort of wider context of things and its not their first language and they are coming to do a degree here they can play things back so there's a lot of reasons. Erm anything we didn't like about the videos? Anything at all? You can say anything you like.
It wasn't the actual videos themselves it was more like the online platform. I tried to watch them the day before and they weren't working.
Some of them aren't working yeh.
On Vital?
Yeh, they were working the day before that, like there was an error on it when it was loading.
Ok. Anything else we didn't like about them? Or even the concept of doing some learning at home before coming in? no?
You said there were some good things, some people have said it might not be a good thing in regards to asking questions, they felt as if teaching gave the opportunity to ask questions in the classroom was almost replaced by a video where they don't get that opportunity and then the desire almost to ask the question diminishes to the point where you come in for the classroom session and not that you've forgotten your question, but you don't have that same drive to ask it. What do you think about that? is that something that you guys would do?
It's a fair point, if there's not a tutor there to ask questions, you are probably less likely to ask unless there was like another session after the video where you could like feed back questions or something, I don't know or an email or something.
Ok any other problems with the videos?
Also I'm more likely not to go to the lecture coz its online.
Ok so that's interesting coz nobody has brought that up. So erm to me that's an obvious one isn't it really? Erm why like would you go when you can watch it in bed?
Yeah exactly!
You know and erm that's a good point. Anything else? No?

erm lets then talk about the conventional lectures, you guys have had lectures for years so you are well versed with them. Erm what are the good things about a lecture, like what do we get from that? what do you guys get from normal lectures? They can't all be terrible!
It actually makes you go and do some work. If you have got the choice to watch videos as and when you want,
You might not do it!
Probably won't yeh!
But if you are there- you are there.
Yeh it's a schedule you have to go it.
It forces you to get dressed!
It forces you to go to it!
It forces you to go to sleep as well!!! I really don't like lectures.
Ok
Really really don't.
Any other good things about the lectures then?

Sometimes tutors can like say a little nugget of information that's not actually on the slide. But it happens sometimes.
Yeh yeh absolutely. We used to have a lecturer who used to say to us, you might want to take good attention in the next couple of minutes because this might be coming up in an exam that's coming up in the next couple of weeks, erm or something like that. fine. Are good things I suppose erm we have aims and objectives in our lectures so it keeps you on track. You know what you need to do, you know what you need to follow. Erm there is opportunity to ask questions there and then. Those questions might help other people and you might get I really wanted to ask that but I wasn't confident enough to or something like that. erm yeh so lots of different things that are positive about that. You can also write exams from conventional lectures using aims and objectives that's quite good for examiners. Erm what are the bad things and there is one that immediately spring to mind, erm what are the bad things about normal boring lectures?
You are just bombarded with information, like 3rd year first ever introduction to ortho, wasn't it?!
It was just back to back..

Oh god!
It was just so intense!!
It was a week!!
You didn't have any time to take in the information and kinda like let it click,
Ok
It was just constant and you just came out of it frazzled, completely frazzled. You had no idea what was going on whatsoever.
Do we all agree with that?
Yeh, yeh, yeh, yeh!!!
Nobody can concentrate for 5 days in a row full of ortho lectures like, its just ridiculous. Bad enough a morning never mind a week!! Its true though init?!
It didn't make sense from what I can remember until about 4th year when everything started to kinda slot into place, coz it was done a bit slower in 4th year coz it was seminars
And it kinda went back to seminars
Seminars are good.
Seminars are really good.
I don't like the way they talk, it's a bit like … actually be a little bit entertaining! they actually help me go to sleep quick but soothing, I'm like yes! You know what I mean, more like you know, like involve us more like stuff like that you know.
Ok. So do we think these erm the structure might be better flipped so that this these seminars are given to you in 3rd year?
Yeh
Yeh
Yeah
Yeah
Complicated stuff perhaps is moved back?
Yeh definitely
Or another alternative would be to get rid of it altogether.
The lectures?

Yeh the lectures.
Possibly, I think the lectures do serve a bit of a purpose, like you said with the more complicated things, erm but yeh I think the main method of learning we all use best is the seminars.
Yeh you could do part seminars too like appliances and all that, it would be better in a short group, you could talk more.

Yeh I found myself once we had done the seminars, or like prepping for the seminars or something, I go back to the 3rd year lectures and then they would make sense but it didn't make sense in 3rd year. It was only when we had done the seminars it made sense
Yeh it started clicking together once we had done them
Was that smaller groups then?
Yeh
How did that affect things?
I don't know, it wasn't really small it was about 8 people, about the same size as this. So we still got a lot from it but its more personal you know what I mean?
If felt a bit of a slower pace coz in the lecture it was quite quick and then like next slide, next slide, next slide but in the seminars it was slower and we kinda spoke about things we went through and then we can stop and ask questions and its easier
We also had a sheet that follows along, like at the end with the answer questions.
Yeh that was really good.
So that was good.
Ok and was it categorised in any way, so like into topics?
Yeh
Yeah
Yeah
Ok so you could erm sort of imagine right this is anything I need to know about Class II Div I
Yeah,
Yeah
Yeh that's exactly what it was.
That's sounds great doesn't it? So how many topics were covered?

Was there 8?
About 8 or 9.
Ok and do you think that that those 7,8,9 leaflets I imagine like there was 2 lots, are they, did they form the bulk of everyones ortho learning?
I'd say so yeh
Yeh
Yeh
Yeh ok so that's quite interesting, something we can look at. Erm ok so I want a quick show of hands really erm for, I want your hands up if you prefer the normal lectures and I want your hand up if you prefer the videos and coming into do a sort of practical based thing. So normal lectures first of all?
Anyone?
And the videos is that everyone else, is that 7?
Erm and heres a third thing for you, if you could then do the videos, come in just for practicals and also be given a handout like you do for the seminars in orthodontics, erm would that be even better or would that be something that you are not that fussed about?
That'd be perfect.
That would be better, yeh.
So we are all in agreement there. Ok good, so we mentioned You Tube just a few minutes ago and You Tube is, I think it is fantastic, erm I think it needs to be policed quite carefully because you can watch a video and you don't know if its amazing or you don't know if it's the wrong stuff and you don't want to learn the wrong stuff. Erm but that sounds like from this morning as if a lot of people do that. Does anyone else do that here in relation to orthodontics or dentistry in general, anyone else? And it happens for oral surgery as well with you? How do we get on with oral surgery? Oral medicine sorry not oral surgery. Or both?

It terms of You Tube?
In terms of videos, learning all that kinda stuff, You Tube.
I use You Tube for like preps for crowns and stuff, like sometimes before I have a clinic, erm if I'm doing it, that's the only things I use it for, I don't use it for oral med because the lectures for oral med are like really good so there's not much need for oral med.

You Tube used to quite confuse me because they could be from America or somewhere else that's like an English language but they do it completely different to how we do it and I'm thinking of my goodness what am I meant to be doing, what am I meant to be learning?
So it confuses you more sometimes?
Yeh so I just scrapped it and went back to lectures.
Ok that's interesting because that's almost confuses you more sometimes?
It can do, I understand why they can do that, but you'll get a few different videos for the same topic you know what I mean, its just finding the right one but I do agree that sometimes it can be completely different ways to what we do, and if we did that as our answer or our technique then it wouldn't work, or we wouldn't get it right or whatever.
So these things are ok for oral surgery and oral medicine here erm and one of the other groups said there is something similar at Sheffield for tooth morphology, are we aware of anything like that at other universities?
Is that the university of Leeds one?
Yeh the university of Leeds has a pathology one, its like an interactive website thing, yeh it was good, I remember using that. the You Tube video is mainly used for 3rd year, when was doing the whole body, explaining processes like, don't know, ossification and stuff like that,
That was the Leeds one was it?
No no this was, I'm on about YouTube videos now. The Leeds one was morphology 2nd year wasn't it?
I used to use You Tube videos a lot in my old degree for learning like physiology, like PBL stuff, so you watch people draw things, so they would draw it out, like hand drawn tutorial type of things and they would explain like physiology stuff like cells and things. It was nice it was just like watching a video basically, like you are watching a cartoon on blood cells!!
Ok so you think that would be something you would open to?
Yeh
Yeh ok. I take it we are all in agreement with that?

erm here's an interesting thing. What method of teaching do you think gives us the best exam results? We spoken there about how we prep much more satisfied getting videos for various reasons really, visual, auditory, whatever, erm what gives you the best exam results? What do you think about that?
I think lectures do. Just because everything they ask us is in a lecture somewhere, it is on a slide like something buried deep, 2nd year perio or something! Its always there somewhere!
Do we all agree with that?
Yeh.
Is there a point where we are not learning to pass an exam?
No not really. When you are on clinic…
It's a few weeks away!!!
…Like when you are on clinic and you see something, you'll pick it up and you'll always remember it I think but when you are revising for exams, you are revising to pass the exam aren't you, you're not revising to increase your knowledge. Its to pass the exam. Nothing else, which is wrong really.

Who learns from doing here? Who learns from practical?
Yeah
Dentistry is a practical subject and we have not really spoken about that. I think there comes a time where we need to step away from learning bullet points to pass an exam and starting thinking, because if I got asked, well I have been asked in exams, medical emergency, somebody collapses there, I'm not necessarily going to think, ok let me think about my spider diagram, its in yellow and I've got it on a bit of paper and its down on the bottom right hand side, what I'm probably going to do for me, I'm much better thinking to myself just imagine its happening, so just look around, see who else is in the room, and see if there is any danger. Are you starting to think like that or are you still stuck in this bullet point, and its ok to be in the bullet point because you are at a stage in your career where that's the most successful tried and tested way of doing it, but are you getting to the stage where you do that?
Well for me, it was when we started like preparing interviews for jobs, it makes you think like we are actually going to be in this situation in a few months' time so what would you do in that situation? So I think definitely from that point on, but before that it was definitely purely learning for an exam you didn't think of the real world or what's going to happen when you get into it.

Ok
I think it depends what you are doing as well, if you are on clinic then, you are kinda learning, but if you are doing exam you are just doing it to pass the exam. If you are in clinic and you are doing a filling, you know how you'd do it, like you'd do it this way, but if, every filling is different, its not the same, whereas in the exam they ask us some stupid questions, like you do have to do it to pass the exam.
With the exams there is a few correct answers but what is the most appropriate. They are all appropriate but you try and do them all
but in the real world it wouldn't be like that you know what I mean, we'd all do different things for the same scenario.
Sometimes the text book goes out the window! I have done things that are wild you know but it was the right thing to do.
Erm ok is there anything else that anyone wants to bring up about flipped classroom teaching? about opportunities to change the course, erm anything like that at all, what you liked, what you didn't like, nows your time! Have a think about that. I am going to go around the room and ask you so, maybe is we start the opposite way, erm maybe I could just ask you
I think more clinical exposure to orthodontics, I've not had a single ortho clinic in my entire experience here, though we are going to be expected to manage emergencies, I have not seen anyone with a fixed appliance on or with a removable appliance. I think I would need to be more comfortable in that situation. I might be put in that situation.
Ok a very good point, I think that's reasonable. Do you the videos in some way make up for that?
They definitely help but there is nothing like actually being there nothing can replace that but the videos do like make some way towards it.
For example, the most common one you would probably see is a wire sticking out the back so you know what to do with it, snip it, I suppose that helps a little bit and having the patient in front of you is a bit better, at least you kinda know what to do. Ok that's great thanks.
Agreed, the same, not had a single ortho clinic, erm so more practicals. I think the lectures do serve a purpose for revision and passing the exam but I think the videos would definitely help understand things more in terms of what you would do in a certain situation.

Fair enough.
I think it would be useful to have like a practical on a lot about the removable appliances and things like that coz I've been shown photos of them but it is quite difficult to actually see how they work and why the work, its better if you have actually got an example in front of you, much more likely to retain the knowledge rather than just learn this is for a Class II or whatever.
Ok erm would it be useful for you guys to see a really obvious case of one appliance, the appliance gets put in and worn and they come back 6 months later and then you look like this and so that appliance does that and then from there maybe go into train tracks and then 6 months after that they look like this and so you can see someone that you should refer, someone that has been referred properly and gets the right treatment and then what is finishes up like. And a summary of each appliance. Ok that's a good idea.
How about yourself?
Yeah I completely agree, I think more experience in clinics, coz we get a lot of tested on what is the IOTN of this and we are given a picture and it says like the overjets 4 mm whatever, but it would nice to actually physically do an examination on a real patient, not just be given that information coz until you have physically done it, I don't think, well I think with me I don't completely understand it unless I have physically done it, so I think that would definitely help.
Ok so actually seeing the patients ok, erm maybe I'll talk to everyone at the end about the reasons why but I agree with that. how about yourself?
Yeh I agree with the points that have been said. I think erm maybe have a refresher day, like we had one in 4th year I think, and there was like, everyone was there and we had like 5 cases or something in groups and we all talked through them and stuff. Yeh I thought that was quite useful, so maybe just one day in 5th year like that, coz I feel like we do a lot in 3rd and 4th year and then not really so much in 5th year. So yeh
So maybe towards the end?
Yeh just to kinda , refresher thing.
May be the structure? Easier stuff and the beginning like seminar and difficult stuff at the end when there is time in 5th year and everything is starting to come together a bit more do you think? Maybe seeing patients and get some videos of patient and stuff, ok that's great thank you.

Yeh I think we do need an assessment or if that's, if we cant do that, maybe seeing an orthodontist doing an assessment would be really useful and then if we can have a chat about what they are doing and see it a bit more, that would help so much more, like learning IOTN and trying to apply all that and erm we have already mentioned about the block of lectures in 3rd year, I think that need to be completely scrapped, because it is just not useful to anyone, to like staff and students.
Ok erm do you think that time is better served doing something else?
Yeh like even just like the seminars, start the seminars in 3rd year , just don't have that week of lectures and then start the seminars then, if that's appropriate
Or maybe you can use that time for appliances or photos of cases of what to refer and when. Ok and lastly?
I think that the only ortho things I can actually do is skeletal Class, that's the only thing I can do, like I don't know how to measure overjet properly like, just models but its not like real, even when we did the cases, like this patient has overjet of whatever what treatment plan would you do, its like we are, but give us models but where are the actual appliances, how can we do just do oh yeh number 1 is appliance 2 its a twinlock or whatever, like we need to see it. Not just like pictures but like sure you know what I mean?
Yeh yeh its like you almost need to have the basic understanding and then know what the appliances do to sort that and then erm know exactly how to measure the

overjet because there are lots of, you said overjet there, but what happens if you have got upper centrals and one of them is like that and one of them's like that, where do you measure the overjet to? Do you know what I mean there are lots of little new answers there and that can make up the difference between someone getting treatment and not, so erm that would probably come from, erm clinical like seeing patient on clinic yourselves, seeing people do it, erm

I also feel like the head of like ortho, I email them with questions but nobody replies, then I forget about the question and I don't know the answer so we need more like, we don't get that much experience so they should at least respond to the questions, you know what I am saying?

Ok ok fine, I cant ask who that is! Thank you, thank you for all participating. Thank you for your time I know you are probably busy at the moment. Erm a few other things to say. Make sure you sign in. everything that you have said is confidential, especially that! and help yourself to food, go for it.

Appendix 14: Verbatim Transcription From Focus Group 5

Ok so, I'll just come in a little bit. Its ok come in, don't worry. I didn't realise there is 2 seminar rooms, I didn't realise. Erm so my name is Grant and as you know I am a registrar in orthodontics, everything you say here is confidential, nobody knows anything so please don't use anyone's name , I don't want anyone to know, I literally want your honest opinions so you can say anything ok. The reason for recording is that it gets typed up so we don't know your name or anything like that. The ideal scenario is that we talk about things and everyone chips in so we are going around the room. Also I want a discussion so I want people to agree, interject, I just want people to disagree, chat amongst yourselves whatever, that's the idea of it. So I don't know any of your names but just for me so I'm not rude can I get your names? I'll try as we go through but I'm not promising!! So first things first, er any graduate entrants here? Yeh 1. Ok I'll just write that down.
When I was at your stage, I didn't really, I got to the end of the training and I thought to myself I still really don't know how I learned best and that kind of struck me when I left there, I thought I have done school, I actually did 6 years at uni and then I got to the end of it and thought I really don't know how I'd learn new information and the best way and I had never thought about that. Erm so I just want to start by going around the room, would you be able to tell us how you think you learn best first of all and sort of whether you know of any particular learning styles that that would fall into, does that make sense?

In terms of orthodontics?

No no just in terms of new material. New stuff in general. Anything.

The way I learn best is I do a bit of reading, so I know what to expect and er handout things are like, like if I understand why things are I learn better rather than just remembering this is what it is.

Ok yeh so actually doing and sort of.. is that what you mean?

Yeh.

Ok ok.

I understand what is behind it rather than just remembering facts.

Ok that's been interesting we'll come back to that.

I think I learn best at kinasthetics, so you've got verbal and auditory and there are other types but for me it is best just to do it and not want to read instructions jut practice and so how I get on really.

That probably fits both of you and fits into dentistry as it's a practical sort of thing isn't it. Ok Fine.

I like a bit of reading before so I know kinda a little bit about something beforehand like a lecture and just making notes is the way I consolidate things.

Ok fair enough yeh.

I think for me probably watching and listening like animation or video.

You said listening there, so I take it you know hundreds of songs, lyrics to songs, so they must go in there somewhere, we are all probably like that and it is quite interesting that you have said that so obviously when you are watching a video you are getting that verbal sort of auditory learning coming through, so you think that's best for you?

I think so, or just talking to a few people not necessarily a lecture coz its just completely something separate but just a little group.

So mine's probably a combination of, probably prefer to start watching a video, like crown preps and stuff like that, watch a video on You Tube or whatever and actually practically doing it, I just get bored reading all the objectives

That's pretty cool isn't it..

And as XXX said as well, just discussing in small groups as opposed to a large lecture theatre and stuff as in a smaller group you don't mind asking as many questions whereas in a large lecture theatre sometimes you are a bit hesitant to ask certain things, that's why you might just stay back or you might just think forget it.

Yeh yeh not everyone is confident enough to stick their hand up and ask a daft question and that's certainly put me off in the past. Ok great thank you.

I would also be like a visual learner, or audible.

Ok fair enough. So how would you tend to learn, I don't know, one of your subjects from the degree here?

I think the lectures are (someone coughs!!) notes from there.

Ok so writing? ok.

Just someone speaking and answering questions might help.

Ok ok fair enough.

I think it would be good if we had actual videos of the lecture as well, that would help.

Ok that's something we have spoken about this morning actually, so you have touched on something quite interesting there, so we will come back to some of these things. Erm when was the first time that you guys, just very quickly, when was the first time you guys sort of thought to yourself oh I'm much actually better at listening or I'm much better at writing out notes or I'm much better at doing something and then figuring that out , when was that for you all.

For the sort of visual and sort of doing it after, was probably about 3rd year, but in terms of group discussions I realised in my A levels I couldn't just sit on my own and another thing is I cant sit in silence when I work so I need to have music on or watch tv or something like that otherwise I just don't get anything done.

Ok really, that's interesting.

I just get bored.

I am the complete opposite (laughter)

Anyone else? When did we..

I used to think I was more kinaesthetic but actually I think I'm probably not but that's only in the last year or so.

Last year, cool.

Me I was going to say the same thing with learning in the upper sixth.

You guys? Quite interesting for you because when you guys were at school, you probably couldn't be as much of a practical doing learner?

In my last degree it was more kinda taught on seminar based whereas in dentistry it was 3rd or 4th year that kinda developed better skills I guess.
Ok, ok
I find it like, if you learn everything in theory without actually using it much or using it, learning for exams that fine but then you have just ticked a box, you pass your exams and you forget about it, whereas for example, when I started learning dentures, I had Mr Farrelly, he showed us how to do it and then we were learning the theory in half of the year groups and the he asked questions, at that stage I find learning it very difficult to just read books and understand because I don't really understand what a denture is, although when I get onto clinic and start doing it, then I realise certain things that he was talking about, so I didn't find it very helpful when I was reading books because I just don't understand, I just remember the fact that this is what it is.

Ok yeh ok. Any of you guys relate to that? Maybe more note taking type learners?

Yes sometimes when you read something it doesn't make sense or you don't understand what the natural concept is and you like seeing it sometimes in action.

Like watching a You Tube video of someone doing..

Yeh yeh

When it comes to understanding, there are 2 types of people, theres people who would just accept it and move on and there are some people that wont accept it and need to fully fully understand it before they go ahead and do it, I'm probably the latter, I need to understand it a bit better

You Tube is quite interesting because it could be the wrong information, it could be perfect information, you just don't know, erm but it is quite interesting that you have said that because that's something I have looked at recently erm for my speciality just looking at different ways of doing things, something from the other side of the world might be something that I actually quite like and want to incorporate into what I do, so that's quite interesting. Can we talk now about this flipped classroom type teaching, so we have spoken about doing something being actual practical, getting the forceps up and use them. As you know flipped classroom is where the knowledge acquisition is done at home, you come in and rather than the classroom time being spent just going over what they need you to know, you actually do problem solving, so if you were an engineer or something like that, you would come in and then you would say ok this is the problem how are we going to get around this problem. For us we don't really have that but what we do is using

instrumentation and doing that kind of thing. Erm has anyone done anything like this before? Very quickly.

PBL is a little bit like that isn't it, you go away, you do the reading and then you have a discussion about it.

Yeh it is and what is quite interesting is that erm some of you guys are sort of suited towards PBL some of you maybe aren't erm but this is a PBL course and so there is that to think about as well. First of all, what did we like about focus groups, sorry not focus groups, flip classroom learning, what did we like about videos at home and then coming in and actually doing stuff?

Suit me perfectly because its how I learn

Ideal? are we all in agreement with that, really? All of us?

Yeh

You can be honest, yeh yeh ok. Erm so what did you like about it then?

I found it easier to sort of absorb

Ok fair enough.

Whereas just sitting in a lecture I just doze off or I'll be on my phone, I like anything that's hands on to be honest.

Ok.

I do find Im listening more by watching the video or whatever or doing it here rather than in a lecture.

The good thing about the video is if you miss something you can just rewind it whereas in a lecture you cant really rewind.

Exactly exactly yeh.

They were short and sharp videos really and to the point, so I can remember what the facts from them were, as in a lecture it gets lost because you have got 60 mins..

Someone goes off on a tangent and someone asks a question and then

Yeh yeh, attention span is quite interesting isn't it?

You can do it in your own time when you feel you can focus the most rather than a 9 o'clock lecture and then you have just work up or 2 o'clock and you've just had your lunch

Absolutely yep, that's one of the main advantages about looking at videos at home so you can watch them over again, you can watch the at a time that suits you in an environment that suits you, you don't have to come to formal environment to learn, you can do it in your kitchen or in a coffee shop if you want a bit of noise or that kind of thing. There are lots of other advantages but that's a few of them. Yep definitely, anything else that was good about them that you guys liked other than it was that you could just absorb it better, anything specific?

It's a moving picture rather than a still, you can actually understand it better.

Ok anything else, no? I mean I quite like that you, I actually tried this, I picked up my phone and I could be watching one of the videos in 30 seconds, so I felt as if that was quite a good thing, you could literally do it from bed if you wanted to. You know.

Its not too much information and you could just break it up where you don't need to do everything at once sort of thing

What did we not like about it? I need this to be honest here as well. Anything you didn't like about watching videos at home or coming in and doing practical stuff?

I had the lectures first and then we had the videos.

Ok yes.

We were a bit rushed because we were all trying to get back to clinic.

Erm fair enough yeh yeh. There was no way round that and also short of time. Erm yes I see I know what you mean. Anything else that we don't like about it? There must be something you don't like about it? No. its ok.

The only contrary to what we just said is because they are shorter there is a lack of depth, as I don't think there was much depth to the topic we were learning anyway

You're absolutely right

If there is only so much you can talk about, cutting a wire and putting a bit of wax on

Exactly!

You know what I mean,

You are absolutely right.

Sometimes in lectures, peoples questions are actually quite good so maybe being in a group helps in that respect.

Absolutley Yep yep.

Sometimes someone says something and you kind of thing oh yeah…

And you could kinda feel as if that's helped you? Not necessarily that they are too shy to ask the question but it was probably just helping you from another direction.

I guess there are people who would probably never the watch videos because there are always people who are lazy.

Yep yep. Would be honestly watch videos for everything, it seems like some of us would, maybe some of us wouldn't, I don't know?

I probably wouldn't watch if for everything

No?

For something like oral med, I think I'd probably just prefer the lectures, and replace the things that are sort of more practical I'd prefer this method.
Ok
Like some of the videos Miss McKernon did for like extraction in oral surgery and stuff, that was really good

Yeh those were good just using elevators and stuff like that.

sounds good.

I think if they are just facts that you have to learn I'd prefer just to learn it if its like skill, then a video.

Ok. I almost disagree with you, I think that oral med to me personally is like a very visual speciality so if I see something, if I see a white patch, it may be different to if I see it is speckled or whatever, or if its red, its very much a visual thing, so I think I would prefer to see something.

The lectures you get that and you get it pointed out where the speckled area is or whether this is or that is, whereas if its just a video and you cant see something, you cant really ask the video.

There are probably quite a lot more facts involved rather than just putting a bit of wax on the bracket, like you said there is probably a bit more facts involved so maybe doing erm sort of writing is quite important as well. Ok that's fine. That good. Erm what devices did we use? we spoke about my phone there, did we do it at home? the library? Ipads? phones, computers, I know that it was difficult for you necessarily.

I was in the second group as well so I watched them with you.

Yeh yeh ok. Lets just say you were going to go home now and you were going to have a look at the videos, what would you use?

Laptop.

All of us laptop? Ipad? Ok, library ok. Interesting.

I reckon the good thing is like if you are on the train or something, you got nothing to read you can always bring it up on your phone sort of

Absolutely, I have always thought it, it's a lot of wasted time isn't it on the trains and things like that when you could probably do something useful

But then the Vital doesn't work on the new IOS 11

Does it not?

No
I didn't know that
So it's a bit

You can use it in the browser though cant you?

I don't know, I haven't tried that.

Erm I must have the old one then, I don't know, I don't even know what I have got to be honest. Erm conventional teaching, normal lectures, you have had them for years erm what are the good things about them? What do you like about them?

Specialist lead isn't it, the person is there to answer questions and to kinda give us some expert advice, the slides are online forever so you can go back through them.

And is that the case for you? Are they good to printing the slides online

Sometimes they are a bit out of date,

Like sometimes you have 2008 addition which is a little bit old!

Ok

Slides are sometimes different to what they said in the lecture, like there are only a few bits of what they said.

The whole thing is quite difficult for that, because they wouldn't let your pictures online.

Oh right

So you just have loads of blank slides so it would be like

So you had to go to the lecture really and there was no way of capturing the pictures unless you took pictures of them all or you were sneaky about it

Ok

Because you'd have an appliance made and there would be a blank slide on the next one and it would be like this person
Yeh

No picture so there is naff all that you can learn from it

Yeh yeh

Makes revision very difficult unless you can remember everything in that lecture, there is no way of going back

Ok, so we are bringing up quite a lot of negative things about it, lets keep going with the negative things then, we started off with the good things!! What's the negative things you don't like about normal lectures?

Timings.

Timings ok yeh.

I just work better at night so there is nothing I can do about that

Me too

But I just don't like how they are

Back to back

Even if they just broke them up a little bit
Yeah
Not going to lie, that ortho week in 3rd year was the most unbearable 2 weeks of my life, it was just back to back to back and it just gets so physically and mentally just draining

Ok

The other is that we had all our ortho teaching, most of it, in the 3rd year and then after that it was very little lecture time

I don't see the point in having the lectures if we are going to have seminars every week in 4th year, I found I learnt to much more in the seminars than I did in the lectures.

You just said the same as the other group! So its almost as if you could erm get rid of the lectures and then just come to the seminars. What did you like about the seminars then?

Smaller groups, and you have a discussion whereas in a lecture theatre you can't really have a discussion.

Ok so quite a social learning type thing probably what we are talking about asking questions early on, you both feel a lot happier doing that?

Other student: seminar based already post some questions, you already know the topics what you are covering so if you want to do some pre-reading, know what you kinda expecting, you can do and then in the seminars you can discuss what you don't know or don't understand and ask groups of peers or tutors then, you get answer and other people will bring up their questions and you learn more.

Ok yeh ok yeh.

You can look at the questions before hand and like it wasn't back to back so you had quite a bit of break between seminars like a few weeks or something so it allowed you to go through.

It sounds brutal this, back to back…

They like to do symposiums which I get from one side because it kinda gives you a mastery course in xyz, however it is literally like 9 til 1 and then like 2-5, (no breaks) just toilet stops, you know not like a proper break and I think the attentions span is about 40 minutes or something isn't it?
Yeh
We just sat on our phones or asleep and you know its not good for anybody. The lecturer, it must be awkward for them because they know no one is listening, you can see it, it must be obvious and then we are all sat there kind of no paying attention, so no one is getting anything out of the situation.

Yeh ok

Its just being done because it has to be done.

Ok ok. So we like it is specialist-led, is there anything else we liked about it?

They are available and sort of in depth
Available yep

And the fact if you do have questions you can ask there and then.

Do you do all this without the orthodontic training, er I mean teaching sorry, I don't mean everything now, orthodontics in generally.

I lean more to orthodontics anyway so I find I have the most questions for ortho.
Its because we never get any time on clinic, do we? I think I have had one clinic this year and didn't do anything, just looked at
I know they used to do clinics where students could do stuff within reason, I know we are not orthodontists, but even just to watch or to be involved a little bit more would help me.
So for that reason then, that kinda says to be me that the videos might be quite useful for someone that isn't getting a lot of actually seeing stuff? Ok again that comes back to that.

Coz like you said, with text books you had to understand stuff and
Yeah
Especially when there is more than one answer as well, for treatment and things and you know

I think dentistry is such a practical course and then to write on books in black and white without actually seeing a patient or getting a snapshot of that picture, you don't learn like what before and what after and whats in the middle of that and then just

You don't learn a lot

Most of the time everything you do is patient dependent and so the text book obviously they can only give you maybe one or two examples whereas if you are constantly seeing throughout clinics yo can see it.

Sometimes the text book goes out the window doesn't it sometimes? Yeh ok. This is where I like to erm just get a little bit more creative so I want a show of hands, which one we prefer, the traditional lectures of the flipped version of teaching so videos and coming in for problem solving or whether you would actually like both. Ok? so sort of combining the two.
Can we have the traditional one first of all? Any one just prefer the lectures there are lot of advantages to that? No?
what about flipped? 5.
And both? You must be both, that's fine.
Erm here is another interesting question for you, erm we had a little assessment and erm what method of teaching do you think gave us the best exam results, it kinda seems that a lot more people are more satisfied with videos and that kinda thing and maybe we are thinking we might roll that out but what gave us the best, what do you think would five use the best exam results, does it matter?

The video probably

You think so?

Yeh I think it depends because everyone learns differently so it just depends on how many people prefer lecture based, how many people prefer flip.

Do you know? Was it the lectures?
What was that sorry?
Erm on purpose I am not going to because I don't want to commit.

It will be pretty significant though?

Might not be. It's a small sample size but, I just wanted thought your thoughts about what that would be.

The good thing with lectures and the flip is good for everyone whereas if you just stick to one method then some ones always not going to be happy, whereas if you have got both then you are satisfying both style of learners.

Now that is really interesting that you have said that, the point of doing a video is sort of wider ranging than you might think, so erm you might watch a video at home, so you are getting a visual learning, you are listening to it as well. There might be some words, key points, objectives so that you can write stuff down and you can study them for an exam. Erm then when you are coming in you are actually doing something so it actually hits you guys as well. Erm so when you come into the sort of practical doing bit like that like you were talking about, you can actually talk to other people so there is also sort of a social side of it as well. So the idea with these videos is that you cover the same content but every single learning style rather than just do a lecture which is a little bit more limited in what is can achieve which is exactly what you said. Erm so it sounds like you guys are pretty adamant that you like the videos, would you like to see that rolled out perhaps beyond orthodontic emergencies to orthodontics itself? May be the seminars for example?
Yeh yeh
Yeh yeh ok. Erm I don't want to keep you too long. What I want to do very briefly is go around the room again, can I get a closing statement from you, so this is us going to be finishing up, I want to know what you liked about the flip classroom teaching, what you disliked about it and if there is anything that you would change, stuff like that, anything.

I liked the accessibility of the videos and could watch them anywhere, any time, if I could change it I might make them just slightly longer.

Ok. Not long enough?

I prefer that method to just sooth my style of learning learning I could watch videos when I want, can pause them, just found them a lot better than conventional lectures where I just get bored, doze off and then have to go home and try and figure out on my own, there is nothing I dislike or would change but then again I have only had it once so if I had a few more times I might pick up on things which I could change or wouldn't want to change.

Ok good thanks.

I prefer this where as a seminar kind of thing coz it is a more engaging environment I think, also if you are struggling, if you don't understand something properly, its

easy to have a proper discussion with you or maybe take a couple of minutes or so or longer than in a Lecture to answer questions so you fully understand it.

Ok yeh ok, so the question aspect of it is quite important to you?

Yeh I think so.

I think so too actually.

I like the flipped classroom learning, you can watch the videos and kinda learn something and then you can apply that with the seminar session and again yeah I need to ask questions and its more interactive as well so I prefer that.

Ok yeh that makes sense.

Yeah I like the flipped classroom with the practical element as well, erm because that is really important to my style of learning, its something we don't get a huge amount of experience with. One thing we have to be slightly cautious with is, that there is a slight novelty factor I guess with the videos, if you had a video for everything you might be inundated with videos and never actually watch them

Yeah We said that didn't we

So yeh we just need to be mindful of that, but I think it is definitely a good way forward plus a bit of discussion based learning plus the odd lecture if necessary but it's a good way to definitely start.

Ok like a good mix,

Yeh and then that satisfies everyones needs.

Ok. Lastly but not least.

Similar to everyone else,

You're last so all the good answers are taken!

Apart from that I was thinking just for learning purposes like if we kinda had videos and a deadline and then kinda say this is how we all talk in a groups so whatever we can discuss about pressure and stuff like that and also to make it more complete, so I like to make notes myself like that so powerpoint for example so I can jot down notes and if there is a question and answer kinda forum or something like that, then people can ask questions and you can see what other people are thinking and then our supervising tutor can log on to that and say this is what it is or

Great, so the other group, what the other group were hugely in favour is exactly the same as what you have said there. They would like the flipped classroom way of teaching but they also said they would really like a sort of lecture power point that they could print out, write notes on and that would help them stay on track almost like a comfort blanket, I think one of them said, so erm they have got information written down there is they need it, do you think you would prefer that do you?

So learning it and remembering it is kinda, you can learn something and then forget about it.

Oh yeh

But if you kinda learn something but the key points you write down and go back to revision that for me is a reminder of it

That might be quite good for some of us as well.

So may be both, have a look at a handout you can bring along, something that stays online for a while. Ok. Anything else anyone, anything you want to add? Nothing?

You wouldn't make any drastic changes? Coz we are going forward now so, nothing? Ok a few things to say, so first of all thank you for coming and you and your willingness to participate. Nothing that you say is going to be divulged to anyone, its all confidential. Erm make sur you have signed the register and there is food over there if you want it. Now there is tea, coffee, pastries, there are sausage rolls over there, there is juice, there is biscuits, there is everything you can think of, so if you don't want any of it fine you can go I know you are busy. If you want to hang around you can.

Thank you.

Appendix 15: Verbatim Transcription From Focus Group 6

..to get typed up so I don't want anyone to use anyone elses name, it's quite important that it's all sort of anonymous, erm and 2 seconds here, erm so you have obviously seen me before, my name is Grant erm I am one of the registrars in orthodontics, erm nothing that you say here is going to be divulged to anyone, it is going to get typed up, we don't know any names you can say whatever you want, it is really important that we can honest feedback from this as well, erm you know you don't have to say anything just to please me, erm I don't really care, erm so I don't know any of you, your names won't get typed up but just so I'm not being rude, what are your names?

How many postgraduates have we got here in this group? 1,2,3? 3 ok

I'm on an undergrad course but I'm a grad.

Ok I'll put you down as a graduate this time thanks for that. Super ok so, first thing to say when I was at your stage, I didn't have a clue how I learned best, didn't have a clue, so I was coming to the end of uni and I thought I have got to pass these exams, I'll give it a good go, I didn't know how actually I done best so I just in a room writing the same thing out time after time after time and then its only when you look back you think that might not have been the best way to do it, so em can we go around the room again and just discuss how you learn best and whether you know of any sort of teaching styles, principles, anything like that

You know what you just said and it's not a good idea that's what I'd do, I'd just write it and write it

Yep ok, well it obviously works well for you – you are still here!

Then I'll write from memory

Ok so you'll test yourself?

I listen to what other people are saying and then I read.

Ok so that's other people in a lecture type format or is that..

Friends, having conversations about work

Ok interesting so you learn quite a lot from doing that do you?

Yeh

Ok so you do quite a lot of that coming up to exams? Ok

I probably use, just like kinda, spider diagrams but like but like just use buzz words and things and keep it very short, erm quite a lot of colour if I can.

Ok you are one of these people who draws circles with arms coming out

Yeh

So how do you think that relates?

I don't really like it when the lectures are huge loads of words and waffley, just simple, so just like buzz words getting the point across

Ok yeh yeh cool

Yeh I'm similar like, I'm the flash card girl, so I'll have like loads of words on a flash card and then I just read through my flash cards.

Right ok, so very much like writing and words,

Like condensing it down and then just

Like a summary?

Exactly

I had somebody this morning that brought a summary of a summary of a summary and then it became a flashcard with one or two words on.

One lecture, one side flash card.

I like that ok. That's quite a good idea actually. Ok. Erm you just fire through them, do you get someone to ask you about them?

Yeh we do get into groups sometimes

Ok

I get bored really easily like just by myself, I can't stick to just one way of erm revision like just writing, I cant do that, I have to either write and type or read, a bit of everything, I can't do one thing, so I don't have one set of something like somethings there somethings there, but I know where it is in my head,

Ok ok. goodness me!

And, if someone asks me something, I know exactly what lecture it is in my head, I know where it is, I could tell you look her blah blah but yeh I need someone to like test me

Ok so question and answering?

Questions and like visual stuff more like someone's telling me you need to do this this and this, I cant process that as well as seeing it on a picture drawn out like you need to do this, like

Ok That's really interesting, so you'd like a mix really of a few different things like visuals and word, some like interaction and questions, ok that's quite interesting we'll come back to some of those things.

I think I'm a bit of a mix myself, I like the flash cards, if there is pictures of things, I will want to look at pictures, I'd much rather look at pictures, or videos rather than a whole book of text.

Ok yeh.

Questions as well, just to show that I know, because if I'm reading I think I know it but if I can answer a question I feel a bit more confident.

Ok so quite similar actually. How about yourself?

Yeah I tend to write my note out again so I do write quite well, but at the minute we are sort of revising for exams so what is quite useful is because I live with other dentists, so we sort of revise independently during the day and at night we meet up, coz we live together, we meet up and ask each other questions, so it is quite useful when you are sort of explaining the answer to people so saying it out loud that sort of helps me revise as well so explaining the answer to someone who is asking questions but we are not testing them, that's quite useful for me.

Sort of explaining your answer rather than just coming out with a number or the answer, ok yeh and its also similar to the question type as well

You learn off them as well, as well as helping them.

Helping each other, so you are actually you work best with other people. How about you?

I need someone to teach me. I don't like sitting and reading through text books, if one of my friends has been through a topic I would rather they teach me and I'd rather listen than write it down.

That's really interesting too, so you are different from a lot of people. So when it comes to words, you like writing things down?

I print off a lecture and read it once and the go back and just highlight it

Ok

And that's it really.

Ok

I'll write things out but then the writing bit doesn't actually help, so I'll write when I feel I want myself to feel like I'm doing work.

So if you are not a big fan of the writing, how do you think you learn?

By listening to things or watching or looking at things.

Just looking at the page almost?

Like I could tell you like if I have got a lecture printed out, I can remember like where it is, like its on the top right corner on the second slide but I couldn't remember what's on the slide.

Its funny that you should say that because I have just started to try and think like that, trying to get everything down on one bit of paper, on I dunno, say crossbites, and then I just think in my head crossbites ok I know if looks like that

Its on that page there!

Yeh yeh so, do you think you are bit of a visual learner then as well? I like what you said there about convincing yourself you are doing work when you are not really!! I think Ive definitely done that

How about you?

So I tend to summarise the lectures and then re-summarise again, but I do what XXX does and do flash cards and then so I just write up bullet points and this word link to that, then it also helps me ask other people questions coz I have to know it, I have to read what it is to think of the question, I like doing questions as well.

Doing questions, ok, so very much questions?

Definitely questions, you can read it as many times as you want but it is only the questions that makes it for me that'll make it stick in my head.

Ok that makes sense, we'll come back to your point in a second. Ok yip

I read through the lectures that are on Vital and like XXX I can remember vaguely where stuff is and what lecture it is, I also use the e lectures and listen to the commentary over that, that's quite useful as well. And also there is MCQ books out in the library and I found they are quite handy as well coz they do the questions and say why it's the answer and why

Ok ok. So you have spoken there about e lectures and listening to some, do you think you are an auditory learner, you like to listen, I imagine you know lots of lyrics and lots of songs, something like that which is interesting because we probably all do so it just goes to show we are not necessarily all about writing or all about vision, actually there is other aspects. Interesting in some ways, I just want to raise a couple of things before moving on here, we are doing dentistry which is very much a practical subject and none of us really said I like to actually do something, erm whereas the group before said the complete opposite. We'll come onto that and also erm it sounds like a lot of us aren't really too suited to like a PBL type course which is interesting because I found out recently that you guy are doing a PBL course! So you can have a think about that. Erm I want people to start chipping in and chatting across the room rather than coming from me so don't be scared to do that, erm so we have spoken about the different types of principles, I want to talk about the flipped classroom teaching so this is where you do knowledge acquisition at home in your free time and coming into class doing problem solving once you get here so the time is saved if you like, if you think like learning French at school, you could've just earnt it at home there was no point in actually coming into school to learn, slightly different but the same kind of thing. If you are an engineer you would be coming in and you would do problem solving so you would be finding out you know alternative means of achieving something, with us we don't really have that so with orthodontics we tend to just use the instruments, hands on practical stuff, erm hands on maybe drilling down plastic teeth that kind of thing. Who liked that first of all? Who liked watching the videos?

So far with orthodontics we have just gone through like a lecture series we haven't done anything practical. So even like putting brackets some of the common things that we do in practice, may be just get the feel things would be a good idea

Well I have just found out, well not just found but I have become more aware that you guys don't do anything on clinics any more.

Well I haven't I think some people might have just got to observe but they just stopped that for our year.

Ok

We haven't even seen some of those examples in orthodontics, so literally like a lecture series and that's it.

Ok ok. Do you think that is a good way of doing it?

No its terrible.

So if you are not seeing it on clinic, do you think seeing it may be in another way like a video is a good thing to do?

Yeh. Like IOTN things like that we might actually have to do, like measuring overbites and things like that, like I don't know how to do that. I wouldn't know how to do that so

Its not a stupid thing to say unless someone has shown you, you don't know. Erm so yeh I get that and I am trying to think back to when I was in your shoes and I think I was probably the same to be honest. Nobody ever showed me how to measure from and to, know what happens if one incisor is out and another is back, where to you measure to – I don't know.

What would you do in that case? (Laughter)

Erm videos, let's go quickly back to the videos again before we lose track, so what's the good things about the videos then, we have already said you can see things you wouldn't normally see in practice, anything else that you liked, what did you like about the videos?

Say if you are in a lecture and you miss what the sort of teacher says, you miss it, but with a video you can always go back and if it doesn't go in you can go and start from the beginning, rewind

That's probably the most obvious one isn't it.

Definitely needs a narrator, the video alone wouldn't be as good, you'd get very bored as well.

Ok yeah

I quite like short videos as well just like, I quite like the short videos as well rather than one big long one coz you can break it up and watch which one after a coffee you know, so when you see one like 60 minutes you just like oh I'll do it later. So 5 minute short ones are good.

Also it is good way to categorise things as well, so if you just want to go back to looking how to like cut broken wires you literally go to that exact one and go through the whole thing.

Yeh ok fine that's good anything else?

It like helps you make sense of like what you are learning coz a lot of it like we are just learning theory and I feel like Im having to go home and make sense of everything that I have learnt I have not understood it in the lecture and I am trying to make sense of it. If I saw it or whatever like physically saw it, right ok that's what they are trying to show, coz the theory I cant understand it on its own by myself to make sense of it.

Yeah, especially something I think that you are not, you don't see all the time, you've had no exposure to, you'll probably never get much exposure to later on either. It is really difficult I think isn't it.

I think like you said, dentistry is a practical course and you have to have practicals and you have to physically see it, just me having braces I feel I have learnt so much about what things are and stuff..

Yeh so again that just's sort of seeing it, feeling it, like actually living it and experiencing it is

Exactly

It is helping you in a different way. Ok. Anyone else like aspects of the videos, anything else they can think of?

They are quite clear and sometimes we have had videos where you cant really see what is going in the mouth because it is quite a small cavity, so

Was that things like oral med videos?

No oral med is quite good actually, no names,

Erm ok lets talk about the disadvantages of the videos, what did we not like about that then? Anything we didn't like? Having the videos at home or outside the classroom then coming in, anyone think that was a bad thing? do they miss things? was there anything they didn't get, don't be scared you can be honest here. Nothing? Nothing at all?

You don't have a chance to ask a question do you if you are watching a video at home.

If you could do like a comments on the video and someone like yourself could come back with answers to questions

That's a good idea. So a bit more virtual learning environment with almost like a forum type thing where questions could be asked and answered simultaneously?

By someone who knows the answer for sure.

Would you look at the questions the other people have posted and think oh yeah that actually clarifies it?

If there is a question that I might have thought of and there's already an answer then its happy days init

Ok erm we'll come back to some of those point in a bit. Normal lectures, you've had them for years, that's just my opinion you guys might love them, I have been in a few but they have got their advantages. Does any who loves normal lectures?

Depends for me like, if someone is really interactive and speaking really well, and you are wow I am actually interested, I would love it I really wouldn't mind, coz erm yeh but if it's like, obviously I am going to switch off

Yeh

I think you can tell if the speaker wants to be there or not, so sometimes you have a lecture like you said and they are just so engaging and then you want to listen and you can't not listen type of thing, but other times you would just switch off

Ok

I think as well the length of the lecture, you can be really enthusiastic in the first 15 minutes and then it just loses itself like split up into topics having like a 5 minute breaks and then continuing.

Yeh that's true because we have literally got lectures online that are 60 slides

After the first 20 I have probably lost interest

Yeh

Theres lots of studies on attention span and having something that is 60 slides long, you are going to be lost after..

But you could attempt some sort of write up with the videos if that makes sense?

Yeh

If its just online like a written lecture or something with pictures and a lecture to go with the video so you can like print it off whilst you are listening to it

Yeh we are going to come back that at the very end. Erm Anything else? Do you think what you were talking about there with this speaker, is that you more liking this speaker them being charismatic er coz I had a guy at university and the subject that he taught was neither here nor there for me but he really charismatic and I liked him so I actually liked the subject a bit better.

Possibly?
Yeh
Yeh
Possibly

If you get someone who is really boring doing something that's not going to help is it?

Even though you don't know them though, if their tone of voice or you know they are just mumbling or they are in corner, you are not going to listen, but if they out and they are speaking they are going to be more engaged.

Yeh.

How well they explain things as well because I found like that in the 3rd year ortho lectures, they expected we knew more that we actually did, so they would say this is this component and we are like what is that actually and they try to explain whose and we were like we don't really know

But then the 4th year seminars that we had coz they revisited the stuff I found that I learnt it much better in 4th year cause it was the same sort of

If they swapped it would be so much better if we like had the smaller teaching first and the just a revision recap lecture the year after,

So there are things you guys have said of being echoed in the first 2 groups today, so we'll come back to that then. So good things and bad things with the normal lectures, so I suppose things for me are that it follows like a plan, you have got objectives, they are good for exams, anything else that are good in normal lectures that people like?

It's taken by a specialist in that subject normally so that's quite good?

There are lots of things that are good with that, erm it really depends on the speaker I think doesn't it, because how they talk and how they attack is very much part of their own style on the lecture and their own style of teaching, they might walk up and down and sort of have a chat with you and make jokes and stuff like that or they might just be dead pan boring.

Erm so the bad things with a lecture, anyone think of any bad things?

For me personally the timing of the lecture – any one think about that and attendance?

How many lectures have you been to where its been like 9 am on a Monday morning and you can't be bothered. Would it not be much better to pick up your phone and to erm be able to see the lecture straightaway? Yeh? Not have to worry about that kind of thing.

Erm ok I'm doing a lot of the talking here I'm self-conscious so we need to get back. I would quite like a quick show of hand because I don't want to go on for too long. Who prefers, so 3 options, normal lectures, videos and would prefer to have basically a hybrid of them both in the form of videos with a handout for example.

- *So normal lectures first of all, any one for that? No?*
- *and the videos? Nobody?*
- *Everyone wants that handout too so the handout must be quite important for you guys?*

I think it is really important to have a mixture of both because they both have like you said positive and negatives and if you just have the conventional lecture, you will be boring and won't see the practical and if you just have videos, I wouldn't feel like I have been taught anything , I'm coming to uni, I could just sit at home.

Yeh yeh

So its important to be able to ask questions as well, I think.

Yeh yeh. So the idea with the videos is that it might be a bit more em what is the word, well thought out rather than being your first….. for example you are looking at a video, you have the visual learners so they are going to love, you have for the auditory learners so they are going to like and go back to it obviously. When you turn up to do the practical bit, erm you might have to you might want to talk to your friends and so the social learners get hit as well, you are actually doing something so the practical kinaesthetic learners get hit so they like it too. Erm so theres all sorts of different learners and the idea is that what we want to do is we want to help these learners with one sort of thing, erm if we can supplement that with a handout which is whatit sounds like you guys would like then we can do that too or possibly roll this out to other aspects of the course. Now at this point, erm I want to come to the seminars because you guys mentioned seminars, erm I found from previous groups that you have got a big long block of lectures in the 3rd year, what are they like?

Erm long, very long, from usually from what I remember they happened on a Friday afternoon

Ok yeh

Some of them would be like 150 slides long

150?

Yes, so they'd split it in half, 75 and 75, you'd be in that lecture theatre for 3 hours, it's like loads of information and after the first hour or so, people just switch off and then we had the, at Christmas we had the ortho, what was it, the teaching where we treatment plan but we also got more lectures again, but it was the same again the lectures were pretty long but More hands on treatment planning was better. and then the 4th year seminars but they were much more concise maybe an hour an hour and a half long and you learn in chunks which is better.

So we like the idea of the information being categorised so the catergory which immediately comes to mind is like Class I, Class II, you see what I mean, erm shorter sound like as well? Erm what about the effect of class size, class size, size of people in the classroom?

Again yes smaller because in the seminars you felt like you could ask the tutor where if you were in a big lecture theatre you feel like it is a silly question and you might not ask it, whereas other people probably won't know either.

Ok.

We do this things called RPD player, RPD designer for prosthodontics , I think that is pretty good data to pretty much lean for prosthodontics. If they did like a similar thing for ortho where just one day hands on, the year split into 2 groups and then half the group is split for 4 groups and there is 4 tutors in a table and you are doing some sort of practical thing and then also you are learning as you talking with them, so its more hands on but is also more like discuss.

So it's a blend of learning type of thing?

Yeah for RPD design videos one group goes up and explains the design and they get given like 30 minutes or an hour to do the design but like an ortho case with

models , pictures and then just a work sheet what to do and treatment plan and different options, if they could explain that and have all together like.

Do we all like the idea?

That's really good.

Yes!

You have just written the next curriculum!! Ok erm yep ok that does sound good and the seminars before the more complicated stuff or should we just get rid of the complicated stuff?

In the 3rd year we had like something similar so we did have a day where we like broke off and did treatment plans but nobody knew how to do treatment plans because all they'd give us was those lectures where they just assumed that you knew it, like none of us knew what a transpalatal arch was, so having it swapped around so like someone teaching first and then having the design thing big lectures kind of thing.

Are the big lectures though worth the time? Because your time is important.

Quick revision lectures they are because we do have room for quicker revision lectures but maybe not 150 slides.

But that lecture I think just jumps about so much, I think what am I following, I am going there or I am going here??

…. Lectures, range of speakers just a bit more engaging.

Ok ok ok erm fine ok there is lots to think about there isn't there really in terms of categorising it, format and speakers and things like that. What, the other group are adamant that the big long lectures were a waste of time that they would rather they were just gone and the time opened up for something else. How do we feel about that?

If a new teaching style that's better came up then yeah crack on

It doesn't sound like, well surely anything would be better?

So if you do just one on sort of a picture the plans or something and they maybe one or two lines of what it does but it feels like a bit more information maybe, why we would use this and what cases you would use this and there is no such detail it just says what …….. what do knowing this is the name of the appliance.

Yeh yeh

Also it might show just a lower begg so you have identify right this this this is on a beg by yourself and then you can identify what an upper begg would look like on your own, do you know what I mean? Rather than someone else teach that to you, that this is what you are looking for,

Yeh and do you think this could all be done on a video for example?

Do you know what, I feel that animation is pretty good as well but I know it's a lot of money to do that and if there is a 3D animation of how it works in time or something like that so you could see the movement or protrusion

Something like that.

On You Tube.

The other group mentioned You Tube as well.

I use You Tube a lot actually.

Do you? Very interesting. Ok. How do you find that?

If I don't get something, I just YouTube it and it just shows me it like

Its good when you find a good one as well,

There is one really good one, the one with the good handwriting

Oh yeh

It would be good for PBL.

Amazing, amazing.

Dentistry? Is that ortho? Or is that?

No it was for PBL, science, physiology and stuff

Ok

Just how appliances work, or like, or stuff like occlusion or crown preps like, I am always watching videos and that

And put it on a cool little You Tube video type thing?

Yeh

Ok, do you think that kinda thing will need to be carefully eh monitored? The thing with You Tube is any old crap can go on there and it might not be the right stuff that you get taught, it maybe actually amazing erm do you think we need to do something like that in house, or is it ok for you guys just to search at the moment online for how to use a twin block.

There are loads of techniques like, doing dentistry is not something that's black and white, people are using their own techniques as well but if it not something that we have been taught and it is not in our exam, we might talk about something why you doing this, we are all going to be looking outside like that as well so if there was a basic video series on Vital for just us lot kinda thing, so we know we can fall back on this and it has been vetted by the department

Yeh

I think Sheffield does one actually, I have been to their videos, the uni of Sheffield and they do like dentistry lectures.

Ok ok

Probably the tooth morphology one,

Yeh that's really good.

So can you just find that online? can anyone find that?

Yeh

So maybe if you found the links that you would think are suitable for our learning, so that we can just click on that You Tube link rather than us looking at left, right and then so were looking at what you would be expecting us to know for our exams

Yeh absolutely, yeh that's a good point. Erm what else would I like to cover here? Erm so we have spoken about quite a lot of stuff there. In terms of enjoyment, do you think having the videos makes you enjoy the stuff more, it certainly sounds a lot less boring than sitting through 250 slides! Erm is that important to you? Coz you can go anywhere to do dentistry, erm the other thing is exam results, so there's a little assessment now do we think that one group did better than another and if so which group did better?

I think the one that did the videos and practical stuff would do better.

Yeh, I think there was some stuff that might have been said on there that you can pick up in lectures.

The hypersensitivity, I was in the conventional lecture, I don't remember taking in anything about the hypersensitivity.

Ok ok.

That was a big thing in the video if I remember.

Ok anything else?

Can you tell us which like group did better?

Erm so on purpose I don't know because I don't want to give anything away!

Sure

In all honesty, a sample size that is relatively small erm with some dropouts and things I don't think it will show anything even if one was amazing and one was rubbish, I still don't think it would be statistically significant if that makes sense but I've got no idea. Erm I want to wrap this up now quite quickly, I want to go around the group ok, I want you to tell me what you liked about the flipped classroom teaching, what you disliked about it and anything else you think it appropriate, so it might be changes, it might be your learning going forward, it might be anything at all. You can say anything.

Erm yeh with the flip classroom teaching you do know it is there, so say if the lectures gone its gone, you can't revisit it where as with the videos you definitely can and I definitely learn better if I can see something and listen to it. Erm disadvantages, these guys have said you might not be able to ask questions, if you to rely on a reliable contact for that, now what was the third thing?

Erm You can just say anything you want.

Changes in the course?

Yeh changes in the course, do you think we should roll it out, erm to more orthodontic stuff, with better videos perhaps, maybe with a handout as well?

Yeh definitely. I think it would benefit the 3rd years especially, I think it could definitely work.

We liked we had it there, we could see it and also in the video you mentioned a lot of stuff that maybe you forgot to mention in a lecture but in a video like you actually manage to get everything in.

Double whammey

Yeh exactly. What I don't like about it, erm coz I sat back I couldn't see the video that well so I couldn't really see whether you zoomed in or not or but you know what I mean, so maybe if it was annotated and a bit clearer, but that's maybe because I sat at the back. And yeh definitely I think you should do it in the future like the oral med ones are really really good. It is like lectures but she says a point and lets one line go so you can match the line with what she is saying, in the lectures the slides just got so many lines, do you know what, so she uses the picture and the line to go with it, another picture and another line to go with it, you know what I mean so that's a really good thing ad would be handy to show like I don't know different appliances, this does that and then release the picture of this appliance does that and then release the line that goes with it?

This famous Begg appliance that everyones talking about?! (Laughter)

Ok, thank you that's good, great. We'll look at that.

Erm it was good that we actually got to see everything and then in the practical I actually got to like have a play around with it. Erm the only thing I would change is having a handout to go with it.

Ok, that seems to be a very popular thing. Ok yeh that's great, thank you.

I agree with video learning it was useful but also in the practicals as well, so seeing the appliances themselves, so for me I didn't even know what I was here for so I learnt quite a bit on the day in the practical. But yeh again handouts would be useful as well as the lecture, something e can print out for revision to make flash cards if people wanted as well.

That's a good point isn't it, coz you get to construct your flash cards!

I think with the videos, I like the fact that it was like a 3D orientation of it, so when you are using the wire cutters like just looking at a picture of it, or being used in the mouth, to actually see it being done and having the orientation of it there is really

helpful, even with like appliance if you just see a picture in a lecture, unless I see the exact picture same again, I'm less likely to know. If it is on a video and its orientated things like that, its good

So seeing it, holding it, using it type thing?

And also definitely seeing like having the instruments to have a look at, to see exactly what they look like so you can remember it is easier. But a handout as well I think it a good balance.

So a blend of both there is what you are describing so like practical sort of learning and writing some objectives and stuff. Ok that's great, thank you.

Pretty much what everyone else said! But I actually missed the test day so I didn't get to see the, I was on the conventional lecture so I didn't get to see the thing but, yeh otherwise basically what everyone else has said

Yeah Ok no worries.

I agree with everything what everyone said but my favourite thing is a video and handout. I think that would be really good.

But also, with regards to the course itself, I think, no offense to anybody, the way it is, the order is a mess and I think I did learn like XXX said everything in 4th year so just ordering it and just making sure we understand the basics before we can like treatment plan, just know what the principles are, like really make sure we really know before we can do like a treatment plan, I don't know what was going on here back in 3rd year, so that's really important and I think erm going to ortho clinic one day and maybe doing some hands on stuff, if you could that would be pretty good too because you are using the appliances and I don't know what we would be allowed to do, but it would help just one day.

Just anything that you can do?

Yeh, cut a wire to size, put it on, just adding to what they said with looking at stuff, you are actually applying it as well, that's even better.

Again, its kinda holding stuff isn't it? And kind of looking at it from different angles and seeing problems and thing like that with regards to the.. I think ortho is a simple concept made difficult by complicated language, quite often you know you just need someone to put it to you in plain language, you kinda get it once you get it you can start learning the stuff and it makes sense. So maybe we should flip the course to get the easy stuff at the start and then if we need, and I am just questioning whether we actually need the complicated stuff, maybe we do erm for exam purposes, it can't be all easy otherwise you'd have bloomin easy exam questions, but that's something else to think about so that's good. Thank you.

Yeah just similar, hands on stuff was good you know being able to see the sizes and feel the sizes of wires, in lectures just having group pictures of different sized wires doesn't really you know, how are you meant to know unless you actually feel it and see for yourself. Erm similar to what XXX said in terms of lectures at the moment, they are bit of a shambles, some slides might explain what an appliance is, but then wouldn't explain what the next one is, but on a different slide it might and you spend a lot of your time just sifting through slides looking for something in

particular when really you should just be getting on with your work which should be there in front of you. I guess.

So you are having to search a lot?

Especially with ortho like, its complicated as it is, we start looking on the internet and that just opens a massive tin of worms because there's all kinds on there so you do need to have a good foundation before we can start doing on our own research.

Ok. You see a lot of weird and wonderful things on the internet don't you and that's what my hesitation was with You Tubing for ortho for example, it has to be closely monitored. How about you?

Exactly the same?

Yeh! I think personally I wouldn't really benefit from a handout I don't really use them but I think having the recordings to go back to and just like being able to see it and even going onto clinic, the only ortho experience I have is seeing oral med patients on oral surgery consultation clinics where they have to remove polyps because of trauma, that's the only experience I have had with braces, so yesterday was the first time I have seen fixed appliances and just like for revision I was looking at everything with the mirror and trying to figure out all the bits and pieces but that's the only ortho experience I can say I have had.

So you would definitely benefit from being on clinic?

Yeh and with regards to the lectures, I didn't learn, I can't actually say I learnt anything during the lectures, my friend taught me everything, and then the seminars in 4th year were just like revision for me after my friend had taught me and I know she has taught a few other people so!!

Ok ok ok so your paying to be here, your friend is teaching you and then it's almost revision when you get taught properly.

I cant say in 3rd year, I just didn't get anything.

Its ok. I didn't write them so …….. laugher!! No that's great thank you. And last but not least.

To be fair I'm just going to say change the ortho thing do you know just switch up, make it a bit easy and then do the other stuff. As XXXX was just saying, I have never really examined a patient with braces on or any ortho appliance, so actually I'm just about it in my head right now, do you know 2nd floor paediatrics, half of its paeds and half ortho, we just see on the other side you guys, we never actually go there, so if there was a clinic like oral diag where we see a patient and we take a history so you have loads of ortho patients that are on review or you need to just tighten it or something, if we just take a little history and present to staff, after 10,15,20 mins and then the rest of it we can just watch you do, or even if we did that and watched what was doing so far and we don't get much photography experience either, its only restorative we take a lot of pics, but I know in ortho you take pics at every stage, so even if we got to take pictures, with the settings that are recommended by the tutor or something, that could be a good sort of component of the ortho bit, I'm not saying let's do it often, once or twice a year, like once every term or something, but that way we can sort of get more experience in other aspects of ortho and get some experience of taking photographs.

Ok yeh, at least that way you get to see things close up, you are taking a photo of it and you can look at it.

You can look through the file and what it started off as, now its looking like

Absolutely, yeh so you can see long term progression if you like of the patient. In terms of the course, I liked what you said there about small groups, treatment planning, that kinda thing.

Yeh with the models as well would be good.

Yeh ok good thank you. So thank you all for your participation, I know you are not going to get the benefit of it but next year will. Everything is going to remain confidential, so whatever you have said, especially you!! Erm your names and stuff will be taken off that was just for me. Erm don't forget to sign in and don't forget to helpful yourself to any food, there is tea and coffee, pastries that need eating, sausage rolls, don't feel as if you have to eat, you can go I know you are busy. Ok.

Thank you so much.

Appendix 16: Verbatim Transcription From Focus Group 7

What I am going to do is record this ok, and that's just because erm we have had 8 groups or 7 groups of 8-9 people, so I have got all the responses and we are never going to remember them all, so its get typed up. It is all anonymous so don't use anyone's name, and basically we just want to talk about erm the orthodontic teaching in general. You can say anything you want, its all anonymous, you can slag it off all you want and it doesn't matter. The idea is that is just doesn't come from me, it's a sort of cross table, round table discussion erm and that's pretty much all I want to say. Have we got any postgraduate students here? Have you done a degree before?

Yeh, so I would put you down as, so that's 2. Perfect, Ok. I have got a list of questions here, now how I want to start with this is erm to tell you a little bit why erm, I'm going to record on here as well just in case that doesn't work, erm I got to 5th year and I thought to myself these exams are coming up and I am going to have pass these, similar situation to you, and I got to a stage where I thought I should probably do some work for these exams now, so I got my notes and started writing them out and I thought I don't know them very well, I'll write them out again, and I'll write them out again and I wrote them out again and I thought I don't really know this stuff and I thought there must be a better way of doing this, so I want to go around the room and I want you to tell me how you think you learn best. How that relates to any sort of teaching styles, theories, principles, anything like that you know but what I want to know what you do and sort of why you have come to that conclusion. So maybe we can start with you.

How I learn best?

Yeh how you learn best, what do you do?

I'm a visual learner, I just see something and it just stays in my brain, so like all these orthodontic appliances and stuff, the photos obviously help to remember them, but yeah it would be nice to see them in real life as well.

Ok so visually as in just seeing pictures, or you mean actually seeing them doing it?

Obviously you cant, its not always going to be the scenario where it is in the patients mouth, so that, the picture alongside when its placed in the mouth during function will be helpful, but then to see it outside just to see what it looks like to compare, but it's

Would you actually like to hold one of these things, to actually touch them? Ok we'll come back to that. What about yourself?

Erm I like reading it and then like thinking about it kind of in the mind's eye like as a picture, like applying it to like what I do in real life or again pictures, I always go on images if I'm looking for an explanation for something.

Google images did you say? ok, let me write that down and I'll come back to it.

Erm and erm yeah I like watching someone do something and then like clinically I like watching someone do it and then do it myself.

Ok ok so you are very much like watching it getting done and thinking about you would do it practically as opposed to learning, writing, erm learning bullet points doing that kinda thing?

I like reading up first, I like reading it and making little brief notes like if I was revising for an exam, I'd like read it and then kinda I like need to get my head around it so sometimes I would write it, but are we talking about practical stuff or like a lecture?

It was just an open ended question! Yeh how you learn best just in general

For exams I write.

You write? Ok ok how about yourself?

A mixture really, I can have it written down and read it, and that can be fine but usually it is always best to apply it to a situation, so I always think about how that

would fit in, how would I use it, how would I do it? If I can do it, its easier to remember it if I have seen it, it is easier to remember it as well.

Ok ok, so a bit of both, how about yourself?
I am a bit of both, I find if I write it all down, I'll learn it, I'll make like spider diagrams and stuff of everything from like lecture notes and things like that, so it is not reading it from lecture notes and reading it from my notes and then I'll look at pictures and then I'll know what I've written and I'll keep reading and reading and reading it and then look at the pictures related to what I wrote, but yeh seeing it in real life helps too, but for exams and things that it what I do.
Ok so quite a lot of writing, bit of visual looking at stuff.
I have to see a picture like, I couldn't just know what an appliance was if I didn't have obviously more but yeah
Yeh yeh
I like the theory side of it
The Spider diagrams - quite important to your learning do you think, is that what you have done?
Kind of, I just try and cram as much I know most people would think it's a mess but on one sheet so its all kind of there.
And is that one topic?
It will be like, so say it was paeds, it would be like trauma all on one day and then we'd go onto something else like that
So you'd have like more than one thing for kids?
Yeh, like the main topics you'd have different ones.
That's what I do.
Ok that sounds good, we'll come back to that, that sounds good thanks, yeah
I really liked having the interactive full session you know the ones where we had like the distal end cutters and had actual wax being held in the hands, but I think that's much better than someone just sort of talking at you, because when someone is just talking at you it is like ok I can just zone out like for about 5 seconds and I just forget key bits of information.
So you are very much a sort of look at it, do it, touch it, feel it, and do it that way and then you learn by feedback?
Yeh you learn by your by mistakes, someone tells me oh like this is what you are supposed to do, you remember that for next time.
Yeh ok. And yourself?
Mine is really similar to XXXX like write out all the notes from the lecture and then make a poster for each topic and then go back to it instead of having to go back through so many lectures, you just have to go straight to the post-it
Ok And is that a mess?
(Lots of participants talking) I'll show you it if you want to!
Ok that's quite interesting, so erm we have got a little bit of a mix, we have got writing, we have got visual, we have got practical, so its quite good we have got a bit of a mix in the room. Erm when did you start thinking, when did you start knowing, when did you start thinking to yourself, I am going to start with you first because, erm it is very difficult I think at school one to know how you learn best but two especially for if you are a pragmatic sort of practical learner, it is very difficult to know that when you are at school I think and so when did you develop that way of thinking and then was it in any way related to doing a practical course?

I think before university because like you know you had these CUP books which summarised everything, so the information wasn't that much, whereas now it has come to dentistry like I would say that in terms of the volume like, I would struggle if I had to just read it over and over again, but then when I actually did stuff on clinics,

I actually remembered it a lot more than someone telling me you know this is this and this is that, you see it and ok you remember that picture in your mind.
Ok ok
But before university it was completely different.
Completely different? So this course has actually changed your learning, made you realise that the way you were learning before wasn't as good?
It was good but wasn't efficient like now its like doing it with your hands is a lot more efficient way of learning.
Ok. Has anyone else's changed at university?
Its along time ago!
You thought about it any more? no?
Yeah I feel like you cant do it here like just writing out notes because there is too much compared to at school there wasn't much practical. I feel after first year I changed, as there was just too much to be writing.
Ok. I want to talk about the flipped classroom idea, this is where you do all the knowledge acquisition at home erm and then you come into the classroom and instead of wasting time doing the knowledge acquisition in the classroom, you do problem solving. Erm now in other specialities maybe in other disciplines if you take something like engineering they might solve problems by doing different things that way, for us we don't really have anything in orthodontic emergencies what we are doing, theres no way around it so what we do rather than problem solving, either you cut the wire or you don't, for example, erm we get you to hold the instruments and you obviously love that erm, who loved the idea of videos at home and coming in and doing practical stuff?
I liked that.
Did everyone like that? ok. What were some of the things that you liked about it the most?
I think in the lecture I cant focus, I like to sit and learn things myself, so I am really engaged when I am watching the videos and just understanding it and following it through and then when I come in I have got background knowledge and I can then just apply it and then probably learn more from, say I have learnt something online and I have just made a mistake, then I can learn from that as well when its in the practical session.
Ok yeh. Anyone else?
In my last degree we would like read prior to going in the next day to our practical and then in our practical we would fill in a work book with questions in and every time we were there, we handed it in at the end of the year or for like each module and I feel like having that test the other day actually helped it was kinda like a similar situation where you kinda go away, learn it, you come in and have a little test, like that just helped but it made things make more sense.
So like a mini assessment helped you?
Obviously not one that counts, even if it did count, I don't think it would be the worst thing. I mean We did modules where we would have a test every 2-3 weeks and that would contribute to our overall grade and it just helped with learning. The yeah the videos and stuff were really helpful.
And you can go back to them as well, its not just the one off lecture, you can go back and look at them again.

Yeh so in a normal lecture if you miss it, its gone, that's it done and not everyone would feel comfortable with putting up their hand would they and saying sorry can you go back 4 sentences because I wasn't listening or I was writing or whatever. Ok anything else about the videos that we liked?
I think like one thing that I would find would be it would be very hard to motivate myself to like do the work at home before, that's just one thing that I just know

myself and I know my own limitations would I delegate time or would I just be cramming it in the night before.
Yeh absolutely, I am the same so, I definitely get that point. Anyone else? The things that you liked is what I am asking about the videos first of all. We'll come on to the downside in a second.
They were short.
They were just concise and they made sense, it wasn't confusing, wasn't loads of jargon or anything, sometimes ortho is quite hard to understand.
It was clear as well, it was easy to follow.
Ok great. In terms of where we were watching them, what time where we watching them on what devices? What were we doing with all that kind of stuff?
I was watching it on a mac in the evening.
Evening, yeh, would you normally, so when do you learn best, is it morning, is it night, could that dictate? Do you see what I mean?
Well recently I have been working 9-5 during the day because I have had the time off, but usually it would be other times, I would do it at night but I'm finding I'm doing it better during the day actually.
Ok anyone else?
I do it on a laptop.
Laptop, laptop, laptop,
Ipad
Laptop
So no phones, no phones at all? Other groups just used their phones that's all, I discovered that you can watch the video in 30 seconds on your phone from picking it up. Erm fine, erm where guys did you watch it, did you watch it in different places? Erm where did we watch them normally?
I plugged my headphones in the library and just watched it there.
Anyone else add to that?
Yeh, straight after the lecture.
Ok yeh straight after?
Yeh, I mean I missed the practical, but yeah it was good.
Did anyone watch it from bed at home?
Yeh I did!
Yeah I watched it the day before.
The day before in bed? I'm glad somebody did, I think you are the only one today that's said that!

Fantastic ok good, the idea is to make it easy for you, so if you want to watch it in bed that allows you to do that and that is an advantage of it isn't it? Ok disadvantages, you might not watch it, did anyone else find any problems with these videos? No no? nothing, nothing at all? You can be honest.
No I thought they were good.
Well I suppose you could say that you cant print them off, I don't know, can you print them off? Is there notes?
We are going to come to that. so erm
Coz I made own notes for the videos, I wrote down what you were saying.
Yeh yeh so we will come onto that at the end if that's ok. No other disadvantages, no other problems with the videos?
Was anyone else's maybe a bit jumpy or is just mine?
I found the other group before found that it didn't work the night before but that's all I found. I don't know if it was jumpy or not. But definitely problems with erm adds another layer of complication doesn't it? You have to get log in details if you have not already got them because some organisations don't so they don't have ike a virtual learning environment in some subjects so not everyone has that. erm so yeh there is the potential for things to go wrong if you rely in computers, it would

disadvantage some people who don't have computers and things like that. Lectures, you have all had conventional lectures for years now, how do we find them in general, not necessarily orthodontic ones, we'll talk about that in a second. Anyone like normal lectures?
I feel like when we have like a block of 5 after each other, you lose the plot after about 3 maybe even 2 and I am just gone! And I don't concentrate.
Ok fine
That's just me though.
Ok
I don't think it makes any difference having a lecture in dental school as it does having a lecture at home and learning it yourself.
Do we all feel that way? because there will be some people here that might disagree with that
I think you need someone there to explain it and be able to ask questions if you don't understand something cause otherwise you could end up bombarding them with emails if you were doing it at home.
Ok yeh yeh.
(don't put your hand up, just shout out)
Yeh I like listening to someone, I like that, I find it very hard to listen to just a video, like I like them being there.
Ok
I like the idea of having both like but I don't know if that's just greedy! I like yeah the opportunity to ask questions is good as well.
Ok yeh. Do you both, coz you both mentioned the word questions there, (I'll come back to you in a second), erm do you feel that when you came, if you were going to come at the practical session you wouldn't be able to ask these same questions?
No you probably would.

Yeh
Yeh ok. Would you feel that you might have a question when you have watched the video but then your sort of desire to ask the question might diminish between the time of watching the video and coming in?
I think it would probably get more for me.
Yeh
Yeh, you'd wind me up if I didn't know!
Ok so you'd be determined to ask the question?
Yeh I feel like having handouts, I know we have gone to some lectures where they will put the handout of the lecture on like a week after we have done it, and then all your notes are scribbled down from the lecture and then you forget sort of whats what and then you are trying to write your notes onto the handout that you have printed and it is just everywhere the information is just sort of, you don't really understand what you are reading coz I just scribble down stuff if there is no handout and that has happened a few times, it would be nice to have them already there before we go into the lectures, so
So literally have a pile, so you pick one up when you go into the lecture?
Or so you could print them off at home, coz I know like paper and stuff, the people can use them to write on too.
A simple form of flipped classroom is printing off the lecture the night before, looking at it, not necessarily learning stuff before you go it, but actually saying we're going to talk about that tomorrow and then when you go in you have a better idea.
Yeh and when you write your notes from what the lecture was saying, then you've got them next to I dunno a picture of something.
What were you going to say, sorry, I cut you off.
Its alright, I was just going to say that I think last year oral med did this thing where they put like a video with the notes on the actual Vital and you had time to go away

and do it yourself and then the week after you would come back and discuss it, I thought that could have been implemented last year with the orthodontic seminars, where like instead of sitting there for a hour where like vast amounts of information was just unloaded at you, you could just have a video where you know, if lets say in 10 second they said something really important on the video, you can pause it, write it down and then actually go over it a couple of times and then resume the video and like then a week after if you had any questions, you could come back in like in a little group and just say hey I don't understand this and would it be ok if you go over this, instead of them just talking at you. Like they have a lot of knowledge its just that I think as an undergrad you are still trying to workout like the steps, you are still trying to figure out the little things before you can see the overall picture really.

Yeh yeh absolutely and that's something that I would say three quarters of the groups have said today, they like the oral medicine setup and they were thinking if that could be somehow brought over to orthodontics that would be good along with a few other points that we'll get to. Lets talk about briefly then the disadvantages of having lectures. I think lectures are boring. What do you feel about that?

I feel like I've been quite negative, but I just don't benefit from any of them because I cant focus in a lecture, I don't print things for lectures, so I don't know anything and the only time I learn I when I go and do things myself sometimes, just go on Wikipedia to get an understanding but coz in lectures I don't understand it, I am just lost all the time, whereas if I go on the computer learn something like I've got the basic understanding and then I could come back and ask questions about it where I don't understand it, so those videos for me are particularly helpful coz instead of going on Wikipedia or something, I can just go straight to those videos.

Ok yeh anybody else got anything to, any negatives about normal lectures? Negative things?

I think in particular with the ortho ones they had one that was like 200 and something slides and every time I open it it like makes me feel a bit sick!

It is something to do with the concept of the ortho, it can be explained in a much simpler way but it is overly complicated when I read them

So much information as well… yeah

Yeh

… And it just confuses everyone, whereas I think it can be narrowed down a bit, it can be explained in a really simple concept but growth and things, I just remember a handout that I read and was just like I have no clue whatsoever and slowly, I don't really understand it still, but slowly I'm like slowly ok this is it but its still a bit complicated.

On some of the lecture slides too, they have just got picture of an appliance and it doesn't what appliance it is, what it does, what its for or and you go back to it and you're just like I've got no idea.

I think that has a lot to do with who has put the lecture together then because they have a high knowledge and are very intelligent but I think maybe unable to break it down into simple terms for people to learn.

Yeh yeh absolutely so its dependent really, the contents depend on the person, is the delivery dependant on the person as well? how charismatic they are, how much you like them, how funny and engaging they are, erm I suppose you are dependent upon the time of the lecture, on occasions you have to go so its not always the same as they are at home I suppose. Erm and erm finally, I think that's covered all that there. You mentioned a lot of things actually that I want to divert to now. Erm so we mentioned google images, have we used anything else online, Wikipedia, anything else?

The electronic library?

The electronic library yeh.

You Tube.

Now you said You Tube, does anyone use You Tube here? So You Tube's been a big hit in the other groups they absolutely love it. How would, I suppose with You Tube it needs to be carefully policed because you can have something that's amazing, really erm full of information and you could have something that is completely the wrong information, erm you don't really know what you are watching sometimes and sometimes someone on the other side of the world can get to the same point but just in a completely different way, so they are right its just completely different but it can be difficult when you are starting to learn something to see that. So You Tube is something that we could incorporate, is that something you would be keen to do then? especially if that got coupled with a handout? So we mentioned the handout and how important that is, erm, is that something we would be onboard with? Do you think it would be better?

Yeh Yeh Yeh Yeh (collective)

Erm these You Tube videos erm oral surgery also do them is that right and oral med?

Yeh they did one at the start of the year.

Do we generally find that quite positive experience? You feel as if you have been used to that?

Yeh

I want a show of hands now because times running out now, erm who prefers the normal lectures? who prefers the idea of erm a flipped classroom so coming into practical stuff, first of all so normal lectures first of all, so hands up.

- *Nobody really*
- *and then flipped ones, so that will be everyone*
- *and what if we say to you erm if you had the opportunity to have both, so we mentioned having both and you felt a bit greedy, but that would basically involve having videos at home, coming in, doing some practical stuff with a handout, coz then you hit everything don't you.*

Yeh that would be the best way .

Can we have hands for that then,(everyone puts hand up) so everyone ok. Super ok.

So I think the thing is like if tutors did do videos it would be like a one time thing for them, in the sense that they don't have to keep on giving the same lecture again and again, year after year, they do one set of videos and if anyone has any issues then they can use the time that they would have done for giving that same lecture again and again, to answer any questions instead. That would save people a lot of time.

Yeh, one of the main advantages of the flipped classroom in the time saved and erm that's why it's a good thing for the teachers too but the flip side of that is if we replace every lecture with a video some people might not like that because they might find that they are getting a bit sort of put to the side a little bit because their learning doesn't seem as important, so there is a sort of fine balance but I absolutely agree with that. Erm I want to touch on erm 3rd year lectures, so I know you have had a big block of lectures in 3rd year and I know you have had some seminars in 4th year, how did we find those 3d year lectures or is that a bit of a stupid question?!

I didn't have a clue what was going on.

Didn't have a clue? Ok. What if we said to you we could take the 4th year lectures er seminars and make them in 3rd year, starting from scratch and then move the stuff you did in 3rd year back a bit and maybe put that in 4th/5th year something like that when stuff starts to make a bit more sense?

I feel like some of the seminars and the lecture overlapped anyway, so you would kinda repeating yourself but you were learning it more in the seminars than you did

when you a lecture back in 3rd year, so they were the same thing, like impacted canines or something, and it was exactly the same a the lecture.
But you maybe wouldn't know what was going on in a seminar if you didn't have background knowledge either.
Ok. So you felt that content might have to be changed a little bit? Erm with the duplication in content, do you feel as if erm having the seminars first would help with the lectures after, or is another alternative actually just to get rid of those lectures altogether? Do you feel as if they bring anything to your orthodontic teaching?
I think there is an element of what you said that is true like you need some background knowledge if we are going into a seminar, like I think there has to be something, like so you're not just going in blank to a seminar, but like that really long lecture in 3rd year ortho, I think like maybe erm, it would be like having it one block where it is just constant like ortho, that's not great, but if its done differently or
If, what about if we asked you to go away and do a little bit of prior work to some of these seminars, maybe in a sort of flipped sense where you have a look at a video, and then you come in and then you have a seminar, and also you have got a work book or a booklet or print out of some sort, and then a couple of years later you get the lectures?
Yeh that would be good
Would that be the best thing?
Coz there is no harm in having like the same topic again, its like revision, its just like exactly the same.
Yeh

You see in that assessment that you did for this, I think that if we had an assessment for every topic would help, and it would reinforce the learning because you had the practical session first, then the assessment and that highlighted, even though I had gone over the videos and notes and highlighted things that I'm not really sure I've answered that right, and then with the lecture after it and I was able to know, I learned more because I picked up on things oh right that's what I need to know, do you know what I mean? So reinforced my learning.
So you think that combining both is only a good thing really?
Yeh if you have an assessment, it makes it better.
Ok so that's something completely different then in terms of its not teaching style but an assessment style, having a mini assessment is something that we might want to incorporate as well.
Somethings like have questions on Vital and it is not summative, its just so you can go on it and its like a quiz and at the end it tells you your answers and then you would know sort of how your revision is going and what you need to improve on, so you know which..
What subject is that?
What was it, IV sedation I think. There is something else as well.
Instruments in 2nd year?
Yeh yeh they were quite helpful
So this sort of stuff is being done in the dental school and it tends to be I find from today quite well received, people are learning a lot from it and it was oral medicine, oral surgery, a little exam, we have highlighted the importance of handouts as well. Erm You Tube is another thing. What I would like to do is I want to finish off to give you 5-10 minutes to get some food and go downstairs, can I just go around the group, I will start with you this time, what I want to do is just I want to know erm I just want you to summarise basically for you, what this sort of flipped classroom thing experience has been like so if you found it useful, if you would like anything changed in the orthodontic course at all, if you you'd get on great with it, if you think you would struggle with videos at home, anything at all.
Jut generally?

Just generally yeah.
I would say that I like the combination, like XXX was saying before, maybe we didn't have a lecture we just had videos to learn from then I would worry about that but if we had ortho videos and then the lectures after that then that would be good

Videos and lectures, not so much handouts?

Yeh and handout.

Handout. Ok that's alright, thank you.

I think that I probably like, when we had the practical session and I felt that I learned more in that than I did like ortho seminars or the ortho week we had, just in terms of how much I retained from it.

Ok, erm that's interesting, I don't know if you are the first person to say that, not explicitly but maybe implied. Erm that kinda works in quite nicely with you being quite a practical learner doesn't it, so you said you retain loads in practical stuff, so it's important to you to get that, you don't get much time in clinics, so for you that's quite important isn't it. So what we would normally do is just miss you in terms of our teaching if we just gave you a lecture.

Yeh

Ok, thank you.

Um I feel like both having both the lecture and the videos is good but I had the lecture first and then when it came to the assessment, then when we went back and did the practical, I realised there was things that I've had forgotten that we had had in the lecture because I'd zoned out, that was yeh the answer in the assessment, so it kinda became clearer having the practical side and the videos. But I feel like it has been a lot more helpful in any of the other ortho lectures we have had because I actually feel like I can answer questions on sort of emergencies now, whereas some of the other stuff I am still not that confident with, but I do feel like it has increased my confidence.

Ok, maybe we need to do more of this than just a tiny bit of the orthodontics?

Yeh

Because you have got eight topics or something like that and this is only one of them.

But I feel a lot more confident with this one probably than the rest.

That's good to hear, that's great, thank you,

I had the videos at home and then the practical. And I liked that, its memorable compared to a lecture, you go away and forget about it, you don't remember it, but that video is memorable and I do remember it, I remember the content and remember what to do and yeh it's been good, but we don't get much time in orthodontic clinics either, I think that's a disadvantage for us.

Especially such a practical subject, isn't it, you totally on missed out on that and its difficult.

It would be good to see a lot, like you could see the appliances on clinic and see a lot more stuff.

Appliances! I knew I had to come back to something, we'll do that later, but thank you, I'll talk about appliance later.

How about yourself?

Can you just repeat the question please?

Haha I just want to know erm a quick summary about what you liked, what you didn't like, if you would change anything, if you'd change the orthodontic course, the teaching, if you liked the videos, what you would really want from the videos, how is that going to suit you, anything at all.

I think like yeh having videos would be really good and then seminars. video, seminars and then if there is time lectures as well like why not?!

Do you want a handout as well?

Yeh!

Ok so that's quite, you are actually prioritising the seminars in particular over lectures, coz they are slightly different lectures than seminars aren't they? So smaller classroom sizes, more opportunity to ask questions, more cases, photos and stuff like that. ok thank you.
For me, I don't need the lectures, but definitely the videos and then a seminar to kinda just go over things that we didn't get from the videos, and also in the seminar you can also introduce practical work in that seminar. What we did in the practical session that can be done in the seminar.

Yeh definitely.

… so combing both.

Yeh ok thanks. What you were saying about appliances, we could maybe handout in the seminars so everyone can have a look?

So in a Class II Div 1 where we want to reduce the overjet, we would give you a twin block and you would hold it and see on the model and I would show you how it closes to push the jaw forward and once you sort of see that happening, and then I show you this case, look at the case a year now, look at the change, that's changed from that to that erm look what it's done to her face, look what it's done to that angle. You might learn a bit more, so I think these appliances, you get weird and wonderful appliances, and that has been a theme from today, erm you know people kept talking about the begg appliance, it makes no difference to the average GDP what the Begg appliance does because they don't really need to know that, or what a twin block really does, but what they do need to know is when is the best time for the right patient to refer for that, you don't need to know the ins and outs of how to do it, how to.. ok. That's been great, really good today in terms of you guys have brought up things that others haven't, so that's really good. Is there anything else anyone wants to say?

Could we have the orthodontic emergencies like in 3rd year, why does it have to wait til 5th year?

It doesn't have to wait until 5th year, the reason it waited til 5th year for you guys is it is just now part of the GDC guidelines, guidelines is that the right word? the standards of care or whatever it is. Erm so because that has been newly introduced, it is just a knee jerk, oh we have got to do something, we have got to give it to them before they leave, and so that's why you have got that there now. Next year it might be a bit more planned, the year after that would be 3rd years, so no reason why they couldn't get that. would you like to see it earlier?

What do yous think?

Yeh

Do we get examined on ortho?

It depends, we do don't we?

Yeh you don't want to be taught in 3rd year and examined in 5th year do you? but we would think about that. that's a good point, no one else has brought that up.

I was just wondering, you know like the cephalometric metric measurements and all this, it might sound a bit harsh, but I feel like when I graduate I'm going to forget a lot of these things, like you are doing it for the purpose of doing an exam, it's like if you ask me I would remember how to do Pythagoras's theory, I'm not really sure when I would apply Pythagoras theory to my everyday life, I think there is like definitely like a need to understand the basics but not over-emphasise the things that as you know a GDP you won't really be using, in a lot more, like instead of being like this is a twin block, this Class I you use Class II Div I, so that's ok yeh cool this is a twin block, this is when you need to use it, these are the examples of what situations do it, get examined on those specific things, then like

In our exam though we get like 10 questions to calculate the angle, it's like what's the point?

You've got to take them off!!

Yeh, 120……. (generalised laughter)

So thanks for that, I'll answer any questions in a minute. A few things to tell you, erm thanks for your willingness to participate, everything that you've said is going to be kept confidential and make sure you have signed the register which I think you all have and help yourself to any food, it's now 12 minutes to 5! If you have got any questions I am happy to answer them ok.